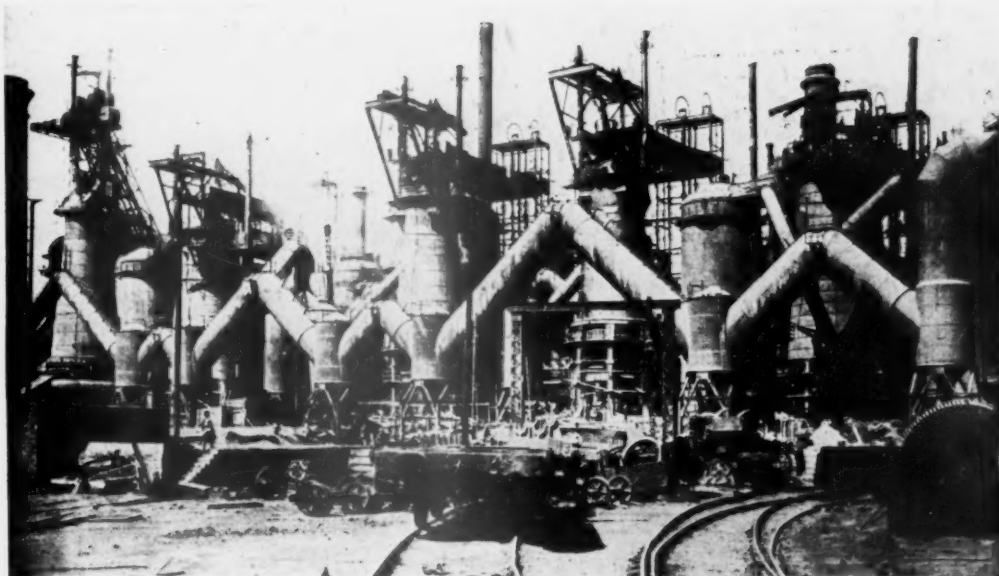


The **MINING** *CONGRESS* *JOURNAL*

COMMUNISTIC RUSSIA

The viewpoint of an
American Engineer



© Henry Miller.

By
William H. Grady



hanging on to a mule's tail!

Dangerous, of course, but not uncommon in certain mines; and no more foolhardy than many other practices that mine workers are given to unless proper operating procedures are established and enforced.

As the oldest and largest manufacturers of Safety Fuse for Blasting we are particularly interested in promoting proper procedure in the use of explosives.

Our representatives will be glad to visit your mines, and cooperate personally with your own officials in studying the practices in effect in your mines and in recommending proper and safe procedures in the handling of safety fuse.

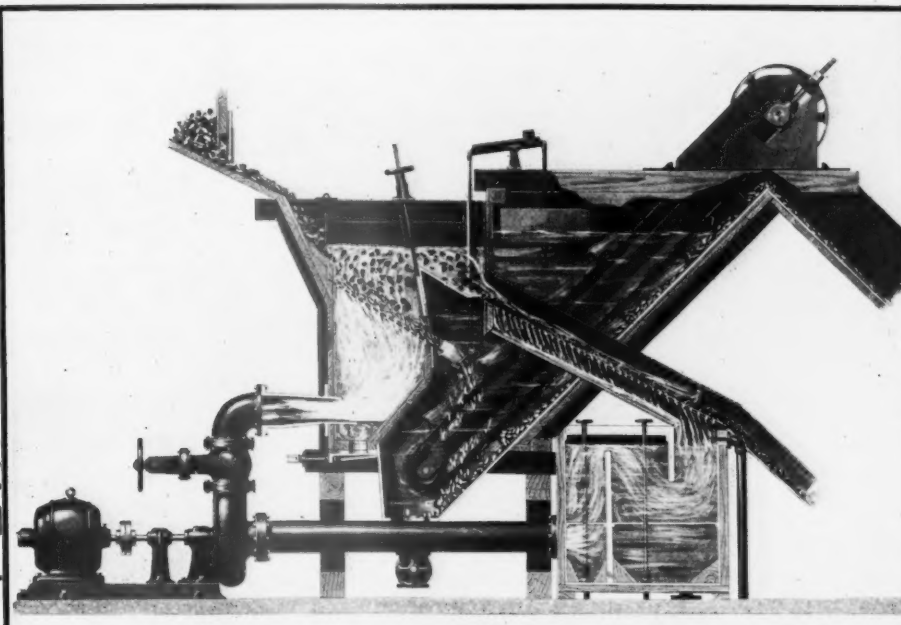
Do Not "Short Fuse"
 --Fuse should be cut long enough for the end to extend well out of the mouth of the bore hole when the primer cartridge is in place.
 All holes should be well tamped.



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THE MINING CONGRESS JOURNAL

VOLUME 17

AUGUST, 1931

No. 8

Contents

EDITORIALS

The Misuse of Credit.....	367	Better Management Trends.....	368
Copper and Industry.....	367	Legislative Efficiency.....	369
Familiar Sounds.....	368	Our Radical Supreme Court.....	369
Pearls of Wisdom.....	368	Rampant Paternalism.....	369



FEATURE ARTICLES

Communistic Russia: The Viewpoint of an American Mining Engineer—By William H. Grady.....	370
Modernized Mining with Track and Catapillar Machines—By G. B. Southward	378
Timber Treating at Inspiration Consolidated Copper Company—By A. C. Stoddard.....	380
Mill and Surface Improvements at the Spring Hill Mine—By L. A. Grant and A. L. Pierce.....	383
Hauling Morenci's Muck—By M. C. Pellish.....	389
Current Trends in Bituminous Coal—By Newell G. Alford.....	391

DEPARTMENTS

REPORTS ON THE MECHANIZATION SURVEY	378
PRACTICAL OPERATING MEN'S DEPARTMENT, METALS.....	380
PRACTICAL OPERATING MEN'S DEPARTMENT, COAL.....	391
NEWS OF THE MINING FIELD.....	399
WITH THE MANUFACTURERS.....	410

Practical Operating Men's Department

METALS

*Timber Treating
at Inspiration Consolidated Copper Co.*

*Mill and Surface Improvements
at the Spring Hill Mine*

Hauling Morenci's Muck

COAL

Current Trends in Bituminous Coal

Published Every Month by The American Mining Congress, Washington, D. C.

Edited under the supervision of James F. Callbreath, Secretary of The American Mining Congress

E. R. COOMBES, Editor

GUY N. BJORGE, Associate Editor
ERNEST H. PULLMAN, Legislative Editor
WALTER LUKEL, News Editor
F. E. PRIOR, Art Editor

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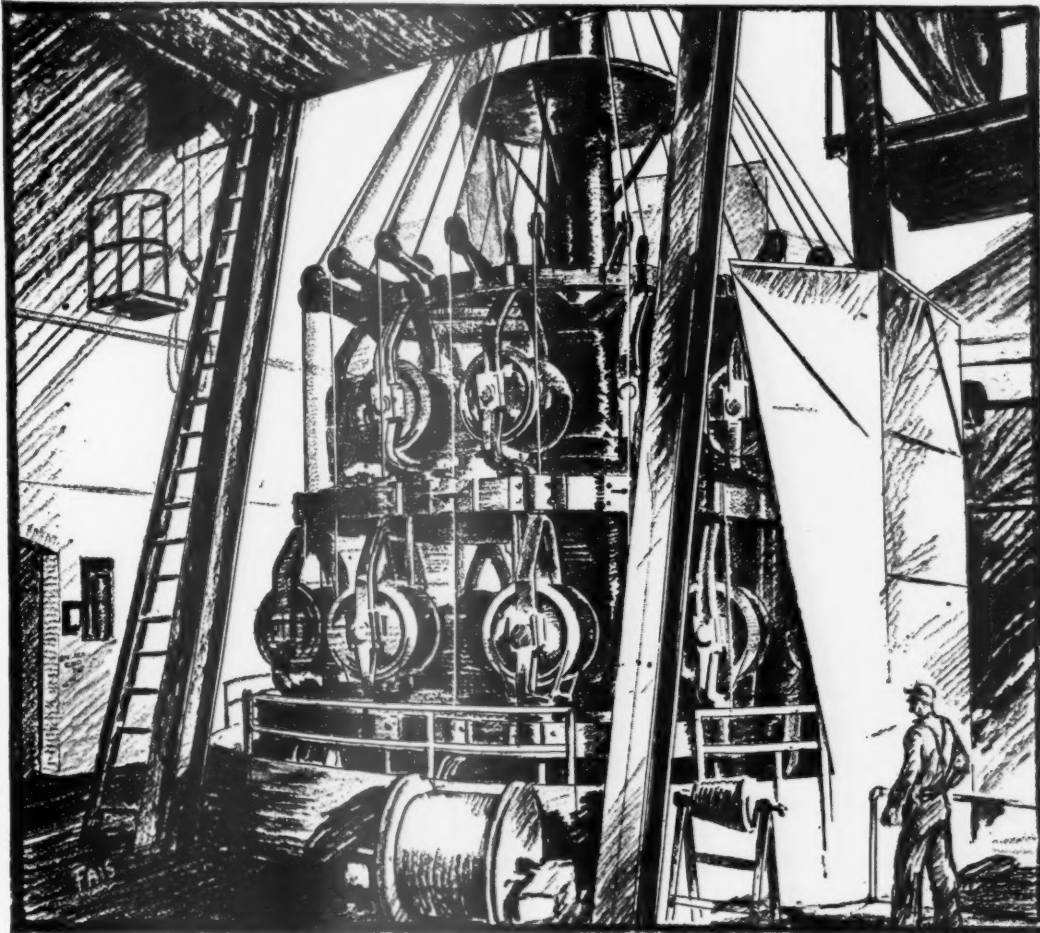
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No. 11 of a series of advertisements on "How Superlative Quality is Built into Roebling Wire Rope"

It strands 37 wires in one operation

THIS giant spins—not fine, soft yarn—but "threads" of steel. It can take as many as 37 tough steel wires—each almost a quarter inch in diameter—and with surprising ease "lay" them into a great steel strand of tremendous strength. Each of its 36 whirling bobbins holds over half a ton of wire.

But it is not the dramatic in this Titan that should especially interest the rope buyer. Rather, it should be the fact that this machine is a striking example of the great lengths to which Roebling goes to engineer into every Roebling Wire Rope a maximum of

suitability, safety and stamina.

One of the many stranders at Roebling, this particular machine makes possible the production of *highly efficient* large diameter ropes, such as mammoth dredge ropes, possessing an exceptionally high degree of pliability. It makes strands for these ropes *in one operation*—assuring maximum metallic content for any given cross-sectional strand area. This, in turn, means greater strength and less internal wear.

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WIRE • WELDING WIRE • FLAT WIRE • COPPER AND INSULATED
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ROEBLING



"BLUE CENTER"
STEEL

WIRE ROPE



OF significance to anyone interested in enduring track equipment is the fact that Carnegie Mine Ties are manufactured from Copper Steel. A recent test on Copper-Steel ties showed their loss of weight from corrosion to be only $\frac{1}{3}$ to $\frac{1}{2}$ as much as that for ordinary steel ties. The actual figures in this test, averaged for ten ties, shows a loss of 19.4 lbs. for copper steel against a loss of 41.9 lbs. for ordinary steel ties. Copper-Steel's resistance to rust is of particular importance in mines where floors are damp, as excess moisture greatly hastens corrosion.


In addition to their protection against corrosion, Carnegie Copper-Steel Mine Ties present many other advantages. These ties are available in a wide range of weights and types, varying from a very shallow tie for room work, weighing only $2\frac{1}{2}$ pounds per foot, to a heavy channel tie weighing 9 pounds per



foot which will accommodate rails up to 85 pounds. Due to sectional design and efficient distribution of metal, Carnegie Ties will not buckle under proper service. Riveted clips eliminate loose parts and special tools. The broad foot and wide bearing surface serve the double purpose of preventing the tie from sinking into soft bottom and crushing on hard bottom.

The heavier channel sections are suitable for main haulage and entry work. Either riveted clips or drop forged clips and bolts are furnished as the service may require. The wide spread and ever-increasing demand for Carnegie Copper-Steel Mine Ties confirms their suitability for all phases of mine haulage. From the face to the tippie, more than half a million Carnegie Ties are efficiently and economically carrying their load with a properly designed tie for every purpose.

CARNEGIE STEEL COMPANY - PITTSBURGH, PA.

Subsidiary of United  States Steel Corporation

129

CARNEGIE  MINE TIES



The large illustration shows the Jeffrey 44-C entering a place preparatory to loading. At the left: The rear or discharge conveyor is shown loading into a mine car. Above, at the right: The loader is sumped ready to load. Note the large lumps and quantity of coal being loaded.

JEFFREY 44-C Brings Mechanical Loading at Moderate Investment...

Pat. & Pat. Pend.

The Jeffrey 44-C Coal Loading Machine brings the advantages and economies of mechanical loading at a very moderate investment.

It does not require ideal or fixed conditions to deliver its daily high production at low cost—the Jeffrey 44-C is suitable for loading coal under practically any system of mining where height of seam is not less than 4 feet.

The gathering head of the 44-C sweeps across the face, doing so complete a job that extra cleanup men are not needed. What cleaning up is necessary can be done by the operators while the machine is loading.

The design of the gathering head, design of the flights and the speed of the gathering chain do not expose the helper to any danger when working at the face while the machine is loading. It is

therefore possible to pull down standing coal as the loader sweeps across the face. This inherent feature of the 44-C permits lighter shooting, resulting in more lump coal.

The Jeffrey 44-C is light in weight, simple in design and very sturdy, requiring little attention on an off shift for the succeeding loading shift. Result: maintenance cost is very low. Power cost is also low—average demand, 5 to 7 H. P. Under favorable conditions the Jeffrey 44-C will load 150 tons or more of coal in an eight-hour shift. It is easily moved from room to room.

The Jeffrey 44-C electric machines can be furnished in Government Approved or open types. A machine powered by air engine can also be furnished.

This economical way to mechanize your loading is completely described in Bulletin No. 519-A. Send for it today.

The Jeffrey Manufacturing Company

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JEFFREY COAL MINE EQUIPMENT

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"Better" mining is more efficient mining. More efficient mining is standardized mining. The American Mining Congress STANDARDS HAND BOOK offers to the progressive mining man over 300 pages of the latest approved standardization practice. Published in convenient pocket size, loose-leaf-binder form, this data is divided into eight major sections . . . Underground Power Transmission and Power Equipment, Coal Mine Ventilation, Mine Drainage, Underground Transportation, Outside Coal Handling Equipment, Mining and Loading Equipment, Mine Timbering and Transportation Safety Code . . . presenting the most complete information obtainable upon each subject treated. The price of the Standards Hand Book is \$5. Use the coupon for your convenience.

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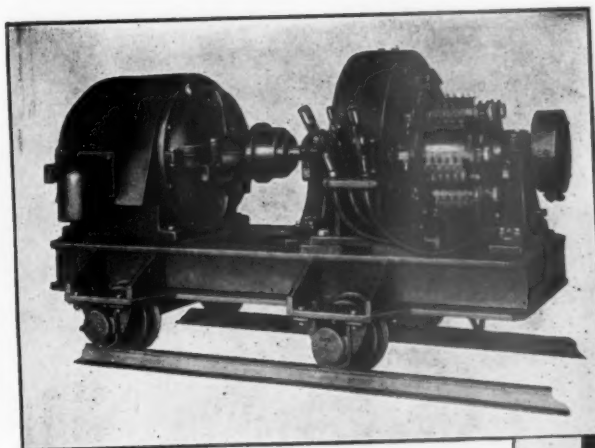
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G-E 150-kw. portable induction
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G-E automatic switchgear arranged
for full-voltage starting of set

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When and where you need it —
without excessive copper losses — with

G-E SUBSTATIONS ON WHEELS

G-E "substations on wheels" are available for all types of mining service — completely portable and applicable anywhere above ground or below. They assure plenty of power when and where you need it; and because their use enables you to take the power unit direct to the job, they eliminate excessive copper losses.

The two units shown here constitute a complete set-up for full-automatic operation. Note how compact the installation can be — how simple! The entire outfit can be moved and installed in *five hours* — think what this means in case of emergency!

For modern mining, G-E portable substation equipments are becoming increasingly popular. Why not investigate their proved advantages? The nearest G-E office will gladly cooperate.

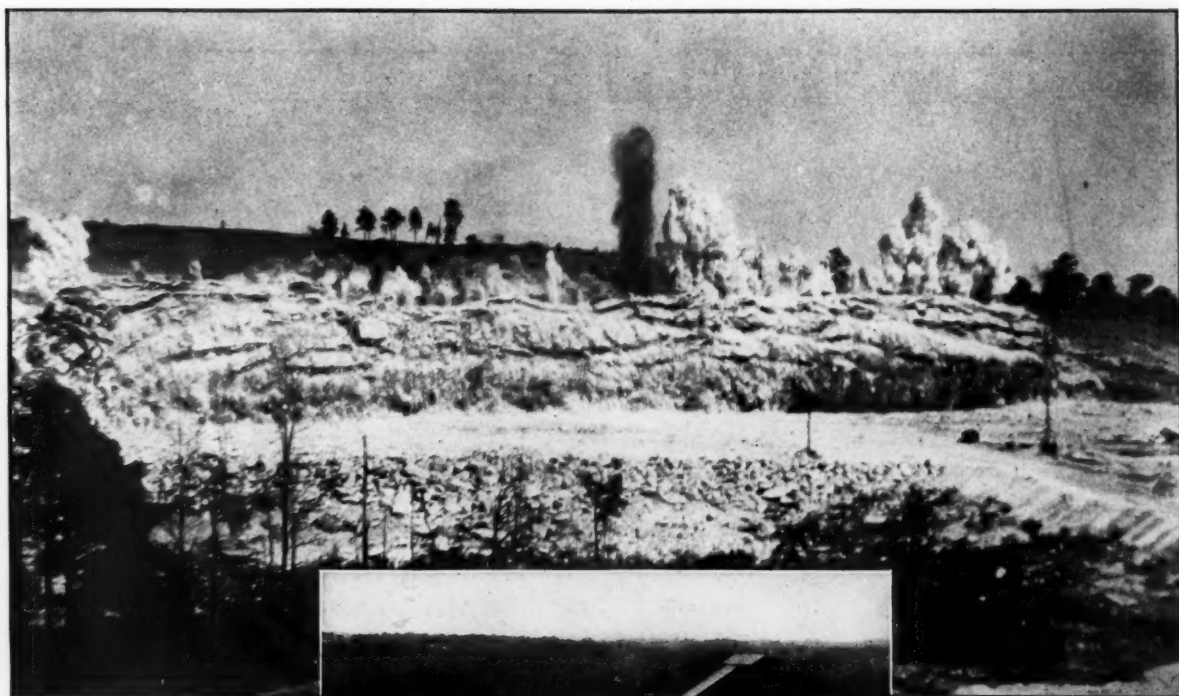
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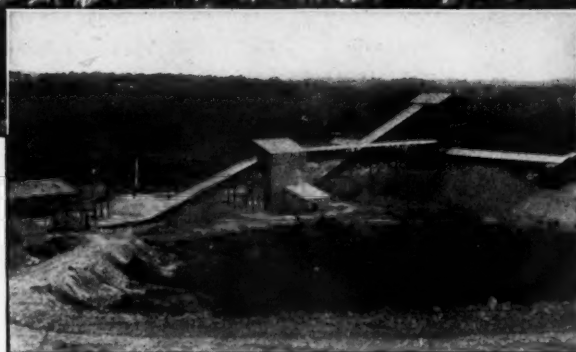
500-67

SALES AND ENGINEERING SERVICE IN PRINCIPAL CITIES

Moving OF GRANITE



*(Above) A view of the
blasts on Rock Chapel
Mountain*



*(Left) The Rock Chapel
Plant of the Consolidated
Quarries Corporation*



E. I. DU PONT DE NEMOURS & CO., INC.

EXPLOSIVES DEPARTMENT

• WILMINGTON, DELAWARE

a mountain WITH DU PONT EXPLOSIVES

Consolidated Quarries Corporation at Lithonia, Georgia,
uses these famous explosives for efficiency in
operation and good breakage

THE deposit from which the Consolidated Quarries Corporation secures its material is a huge outcrop of granite known as Rock Chapel Mountain. It is located about ten miles southeast of the famous Stone Mountain.

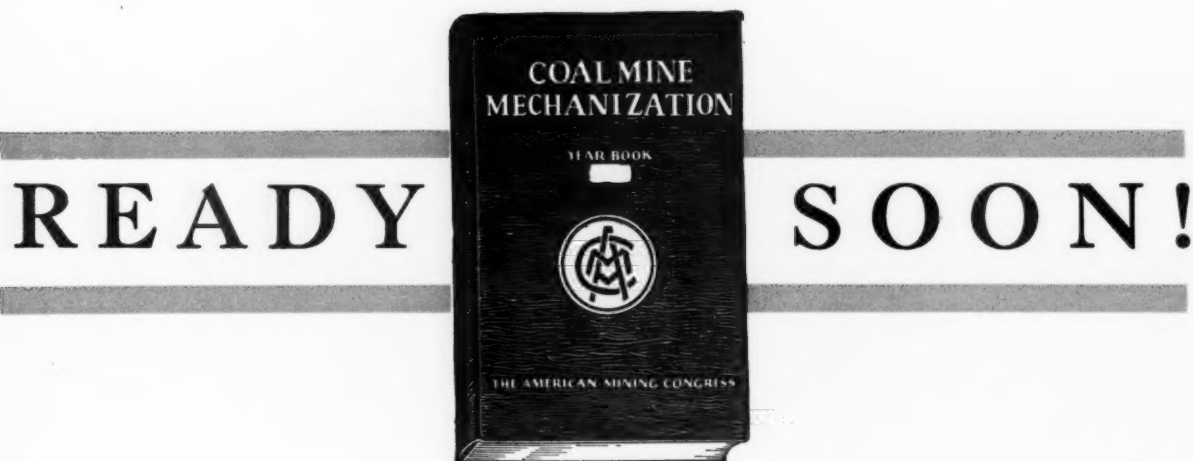
One of the largest blasts ever made in Georgia was made in this quarry on March 16, 1931. It brought down 80,000 tons of granite. It was a single-row bank shot of 42 holes loaded with du Pont Dynamite. The holes were spaced 18 feet apart, with a burden of 20 feet, and averaged 70 feet in depth. From the photograph below, it is evident that the breakage was unusually good.

Whatever your blasting job you'll find there's a du Pont Explosive made especially for it. When you specify du Pont Explosives for the jobs you undertake you specify explosives into whose making has gone more than 129 years of experience. With du Pont Explosives you are assured of satisfactory execution.

Complete information about du Pont Explosives and their use in quarrying and for other purposes may be obtained by writing direct to the du Pont Company. We shall be glad to place your name on our mailing list to receive our Explosive Service Bulletins.



*Result of the blast with du Pont
Explosives. Note the good breakage*



Greater in every department than ever before, the new 1930 edition of The American Mining Congress MECHANIZATION YEAR BOOK will unquestionably be the most comprehensive work of its kind ever published. It will deal not only with coal loading, but also cutting, drilling, shearing, and all phases of hauling and transportation. It will present not only the different operating methods, but also tonnage productions and descriptions of various types of equipment. It will be based upon actual practice and observation in all branches of coal mine modernization. There will, however, be no increase in the price of this year's volume. \$3.50 per single copy. \$2.50 each in groups of five or more. Your early advance reservation is suggested.

The AMERICAN MINING CONGRESS

— 1930 —

MECHANIZATION YEAR BOOK



Zinc Chloride treated timber (marked 6) was installed in 1914 and is still sound today. Untreated timbers on both sides have been replaced several times during this period.

» » IT IS

**WISE
ECONOMY**

« « «

**TO PRESERVE MINE TIMBERS
WITH GRASSELLI ZINC CHLORIDE**

TREATED timbers cost somewhat more than untreated timbers, of course.

The point to be considered, however, is this: Does the resultant saving justify the expense? The answer is undeniable.

The Zinc Chloride treatment adds but little to the cost of untreated timbers, yet it prolongs their life many times. It eliminates many costly replacements, reducing labor and material charges and keeping maintenance expense at a minimum.

Untreated timbers rot, usually requiring replacement every 3 to 6 years. Yet numerous actual tests have shown timbers treated with Zinc Chloride to be still in use, sound and serviceable, after 12 to 20 years' exposure!



**Z GRASSELLI
INC CHLORIDE**
A Positive Preventive of DECAY in Mine Timbers

Zinc Chloride treated timbers are *rot-proof, termite resistant, odorless, and fire retarding.*

There's no doubt about it—it's wise economy to preserve your timbers with GRASSELLI ZINC CHLORIDE. Use the coupon for full information.

The Grasselli Chemical Co.

INCORPORATED

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629 Euclid Ave., Cleveland, O.

Please send me, without cost or obligation, your booklet "Looking Ahead Twenty Years in Wood Utility."

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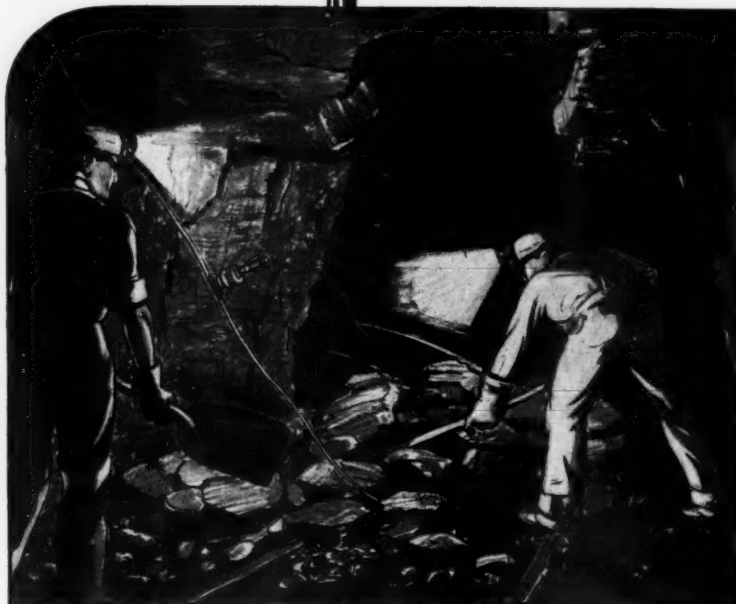
City and State

PULLS, HITS, AND STRIKES— EVERYDAY HAPPENINGS

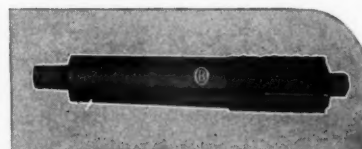
THE DOWNPULL of roof-falls as they strike the trolley, the side strains and smacks of flying trolley poles as they hit the hanger, are everyday loads placed on expansion bolts—and everyday excuses for the tired, ordinary bolts to crack; to let loose their grips and delay haulage. Given strong, non-tiring, non-brittle expansion bolts, mine electricians can keep the haulageway free from such troublesome delays to continuous, profitable haulage.

♦ O-B Expansion Bolts offer much in the way of freedom from such aggravating time and production losses. These bolts are made of Flecto non-brittle malleable iron. Their shell will bend double without breaking. They are thick, heavy and strong. Let the downward thrust of roof-falls, let the everyday pulls, the hits, the strikes come upon an O-B Expansion Bolt; it will take the punishment without growing tired and cracking. Ohio Brass Company, Mansfield, Ohio; Canadian Ohio Brass Co., Limited, Niagara Falls, Canada.

1376M



KEEPING DOLLARS
from
WAITING ON DIMES



O-B EXPANSION BOLT

Made in 4 and 6-inch shells. Ordering information is to be found on page 496 of the O-B Catalog No. 20.

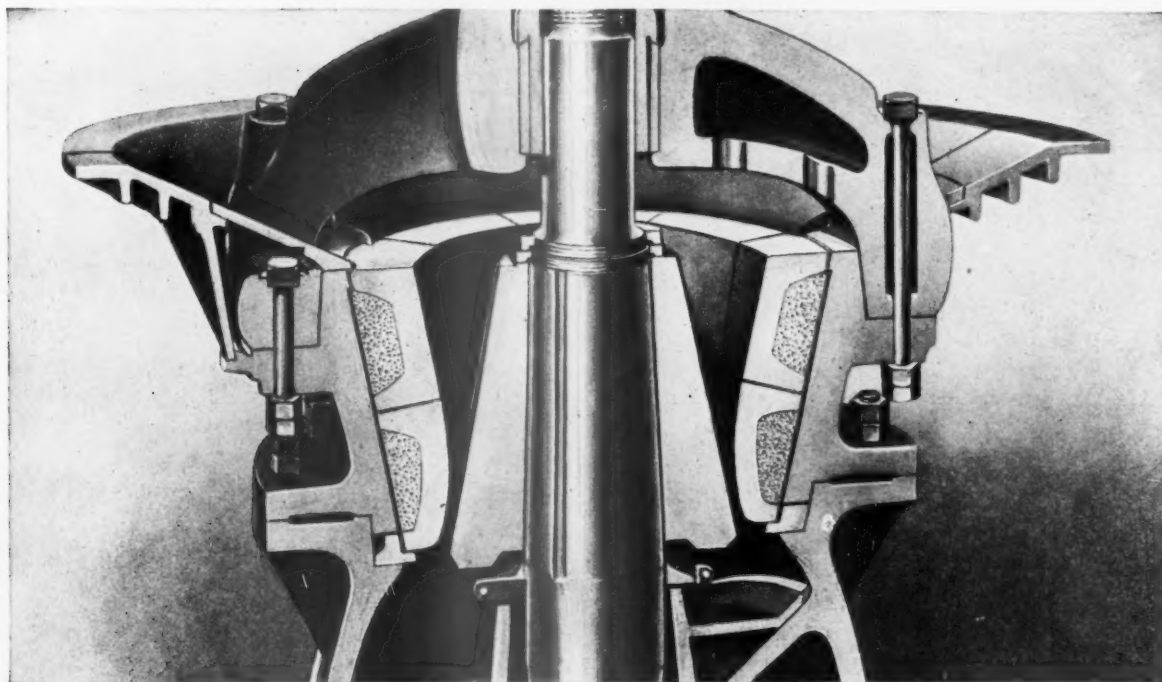
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Write for a bulletin on Allis-Chalmers crushing plant equipment.

— Special Heads Not Required —

The principal advantages of the new concaves are: approximately 50% greater capacities at close settings; possibility of "choking" and "stalling" greatly reduced; present minimum settings may be decreased from 25%-35% without reducing eccentric throw; wear is more uniformly distributed, thus eliminating "grooving" of head at crushing point; due to uniform wear, head does not have to be adjusted or concaves reset as frequently; power consumption and peak loads formerly obtained at close settings are greatly reduced; more uniform product and less objectionable fines than with old concaves at fine settings.

These new concaves differ from all other types, in that if the crushing head is in fair condition you can install new Non-Choking concaves without purchasing a new head. They are further described in Leaflet 2132.

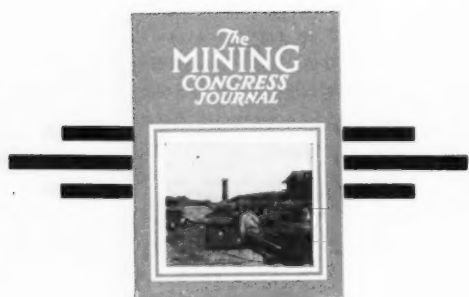
ALLIS-CHALMERS

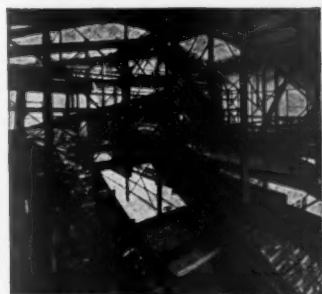
— Allis-Chalmers Manufacturing Company, Milwaukee —



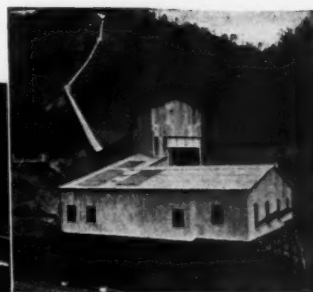
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Out of every 1000 mining men who read The Mining Congress Journal, more than 900 are executives ■ Presidents, vice-presidents, general managers, managers or superintendents ■ The men who either place the actual orders for, or directly influence the purchase of, every piece of mining equipment bought by their organizations ■ The sales manager wishing to present his product most directly and economically to its most attractive buying market will immediately recognize the effectiveness of the opportunity here presented ■ He will advertise its story in The Mining Congress Journal ■ He will "Tell it to the *man who buys!*"





Fairmont Rope-and-Button Conveyors at mine of the Blue Diamond Coal Company, Bonny Blue, Virginia. Capacity 300 tons per hour.



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ROPE-AND-BUTTON CONVEYORS

In rugged, mountainous country, like that of south-western Virginia, it is a real problem to put properly prepared coal into railroad cars economically and with minimum degradation.

At Bonny Blue, Virginia, this problem has been successfully solved by the Blue Diamond Coal Company through the use of Fairmont Rope-and-Button Conveyors. Two long conveyors—one 944 feet and

another 990 feet in length—safely lower the coal down the steep mountain side.

And in the tippie, Fairmont shaker screens, picking tables, loading booms and other auxiliary equipment insure accurate sizing and thorough preparation.

Fairmont engineers will be glad to discuss troublesome coal handling and preparation problems with any responsible coal mining executive.

For further information write

FAIRMONT MINING MACHINERY COMPANY FAIRMONT, WEST VIRGINIA

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Material: Timken-made steel.

Design: A full complement of rollers uniformly spaced around the cone by a truly perforated cage, thus uniformly distributing the load and eliminating internal friction. The rollers are also positively aligned longitudinally by two-area contact on the cone rib.

A third of a century marked by a continuous series of engineering accomplishments in taking friction and headaches out of one industry after another.

The successful application of an anti-friction bearing to any industry or to any type of equipment vitally requires two basic factors. *First*, correct bearing design, material and construction. *Second*, long experience in applying the bearing to meet individual specialized problems.

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Timken's 33 years of experience show that it takes several years to thoroughly prove out a bearing in any industry.

Furthermore, it takes many years to develop the proper refinements in a product for the specialized service of any given industry—such refinements as the correct heat treating, the necessary precision processes of manufacture, and the proper engineering of bearing mountings. These things come only from minute contact and serious study of the actual operation of the bearing in the field over a period of many years.

Timken Bearings have long since passed that period. The great body of Timken users know that when they buy a Timken-equipped machine they are not experimenting, but that they have the two factors necessary for satisfactory machine operation—the correct bearing, and Timken's long experience in applying, mounting, enclosing and engineering that bearing for specific applications.

THE TIMKEN ROLLER BEARING CO., CANTON, OHIO

TIMKEN Tapered Roller BEARINGS

The MINING CONGRESS JOURNAL

A Monthly Magazine—The Spokesman For The Mining Industry—
Published By The American Mining Congress

VOLUME 17

AUGUST, 1931

No. 8

Editorials

The Misuse of Credit

gold, the World War, the fall in silver prices and over stock speculation, each has been given credit for the present world business depression and each of these causes has been advanced by many individuals. The waste of any great war create penalties which must be assumed by the public.

It is true that proper business planning might have avoided the present situation. Prudent business advisors always urged a careful use of credit. Credit itself is always essential to expanding business but a misuse of credit and a too great expansion of business always bring dire results.

It may safely be said in lieu of all other alleged causes that the misuse of credit was the most important and perhaps the only cause for our present world business depression and that wherever this credit misuse could have been avoided by proper planning that there should have been no business depression. It is frequently stated, and probably correctly, that every general business depression of modern times has been preceded by wild stock speculation which as a rule follows a period of usual business activity which in turn results from opportunities for unusual business profit.

When we say that a misuse of credit is a main cause for business disaster we mean that too large business is done with credit money for which there has not been a substantial metallic base. The uneven distribution of gold among the countries of the world can not be avoided so long as free gold markets are maintained. Successful business operators are entitled under this system to control the gold which represents their profits and therefore the most profitable enterprises will control the gold supply and it follows that to make an even distribution of the world's gold supply calls for equality of business earnings throughout the various countries of the world. The even distribution of the world's gold supply among the various countries in proportion to their several needs would leave each of those countries with a supply of gold too small to properly support the credit money which is essential in carrying on the world's business transactions. The wealth of the world has been increased at an enormous ratio while the increase of the

world's gold has been very small. The skill of world financiers in accelerating the functions of gold and increasing the currencies based upon it has made possible the enormous expansion of business transactions. These increased uses of credit do not seem able to halt before the danger point is reached which always means a business panic. This constitutes that misuse of credit which we offer in lieu of all other causes as the one reason for business panics.

Copper and Industry

developed by overhead or hurdy-gurdy water wheels marked the first advance from the power of the ox upon the treadmill. In those days water power could only be used at the point of its development. The later invention of steam power required fuel which had to be transported from its source to the point of consumption. The development of our railroad systems was largely made possible by earnings for the transportation of fuel from the point of origin to the point of use. The burden of this cost influenced the concentration of enterprises near the fuel supply or by the water power site. The development of water power was thus circumscribed until the transmission of electric power by wire was developed. For this use copper was the great necessity. The small transmission plant at Telluride, Colo., pointed the way to the enormous development of power transmission for which copper was a necessary agency. In those days the treatment of 1 percent copper ore was an undreamed of possibility. The large consumption of copper required for power transmission led to a demand which in turn developed the present large production of copper. Copper has been the hand maid to the development of our industrial prosperity. Like most other lines of business, copper production has developed more rapidly than consumption and temporarily the copper industry is suffering because of the general business depression. Without copper the industrial progress of our nation could not have taken place. Its production upon a profitable basis is certain in the not distant future.

Familiar Sounds



COAL has been sick so long it has forgotten its original ailment. During the past decade it has been the pet hobby of the political doctors, each of whom has claimed to be a specialist, and to advance a cure. Like all other basic industries, coal has suffered grievously from deflation. With the closing of many mines, large groups of workers have been turned loose upon an already crowded market, and their cries in turn have been added to those of the unemployed millions already in distress.

Such a condition has aggravated an already bad situation, led to strikes, and opened the door to the professional agitators. From the striking areas we hear familiar sounds. The men complain of "low wages," "the company store" and of "short weighing." They assert that the coal companies, themselves, are involved in a conspiracy with their large customers to keep the price of coal down by cutting wages.

Low wages in the coal fields is a perennial indictment, and yet in comparison with the price obtained for the product, the industry has consistently paid a higher wage than many other basic industries, even though a theoretical "living wage" standard may not be strictly adhered to. The company store and short weighing have passed into history as standard points of contention whenever and wherever union labor is under discussion. But the most serious indictment—that of customer conspiracy—is almost humorous. The coal man is faced with the necessity of selling his coal if he is to remain in business, and continue to furnish employment. The problem of meeting competition of fields, districts and even individual companies within districts, keep most operators on the verge of insanity. Every item going into cost of production must be scrutinized; every penny saved that it is possible to save, if men already on the payroll are to remain on it.

The great bulk of coal production is on a scale above these charges. There may be a few companies operating to take advantage of distressed labor, but few indeed are the operators sacrificing their men to profits. If there be a conspiracy, it is more likely between the customers of coal, who seem to take a fiendish delight in purchasing coal at the lowest possible figure, with no thought as to the wages, living conditions, or hazards of the industry.

Pearls of Wisdom



AFTER many months of research in the coal industry, including an investigation of the present difficulties involving the Pittsburgh-Ohio-West Virginia district, The Russell Sage Foundation finds, originally enough, that coal's problem is a "general economic one," and advances the familiar refrain of "too many mines and too many miners." After exhaustive research from such an august body, one is led to believe that, after all, such may really be the situation! It seems to us that some 10 years ago the famous Coal Commission, operating under governmental sanction, came to much the same conclusion. However, the Foundation does add something to the already top-heavy discussions on the coal industry. It advocates the creation of two organizations, one of the operators, and one of the miners, each designed to speak for their respective masses, and with the power to function for the benefit of all. It asserts pointedly that "the great-

est mistake the operators could make would be to try to crush the unions," and equally that "the miners must not oppose organizations by operators designed to eliminate disastrous competition and price cutting, and to institute cooperative distribution and other economies."

It is, of course, in the main right. The right to organize is an inherent, but a qualified right, in all industry, so long as it is not in restraint of trade. But in the final analysis, the Foundation's report merely adds its opinion to that vast pile of wisdom in which we find exactly the same thing said and re-said over many years: "too many mines, too many miners" and ONE Sherman law!

Better Management Trends



IN TIMES like these, when business is throwing off all excess baggage and getting down to fighting trim, it is interesting to note the corresponding increase of interest in projects for training the young executive. Particularly is this true in the mining industry. Personnel training is highly favored, and the development of men of executive capacity from the ranks seems imperative. And there are trends in better management just as there are trends in business itself.

Mr. P. C. Thomas, Vice President, The Koppers Company, presented to the recent Cincinnati meeting of The American Mining Congress his view of "Better Management Trends." He included among the definite way-stations (1) the growing tendency of owners of coal properties to place these properties in the hands of technically trained men, who are using technical and approved methods of making determinations in connection with ventilation, time studies of labor, uniformity of preparation, etc.; (2) special attention to accident prevention work and the responsibility therefor in the hands of men who are thoroughly trained; (3) the tendency to better underground haulage systems, with the use of larger mine cars, better adapted to the height and conditions of the seams; (4) better cost accounting methods, with improved handling of supplies and materials; (5) larger rails, better graded haulage roads, concentrated work and projection along such lines as to get greatest quantity of coal out of given areas; (6) the strides that have been made in mechanical loading of coal that are truly astounding; (7) the holding of plant and division meetings; (8) care of employes, such as proper training in health habits, schools, sanitation, etc.; (9) centralized purchasing, uniformity of equipment; and (10) 100 percent first-aid training and the grounding of the safety-first idea into their minds.

Quite a startling list, isn't it? And yet Mr. Thomas' paper showed a true picture of what is actually the "trend" in bituminous coal. It was based on a questionnaire sent to the leading coal companies in each district, and the final data presented combined the ideas advanced by these companies.

Mr. Thomas' concluding statement sums up the attitude of the mine operator, whether he is coal or metal, and is highly representative of the industry. He said, "The whole purpose being to mine better coal, uniformly clean and prepared, with the minimum of accidents to employes and at the lowest possible cost, keeping our properties at the same time in excellent physical condition and treating our employes in such a manner that we can look the rest of the world in the face without shame."

Legislation Efficiency



as for instance, by an investigating committee permanently at work, the class, tone and volume of legislation, state and national, might be improved and efficiency substituted for the present hand-to-mouth methods.

The volume of legislation suggested at the last session of the National Congress could keep several well-manned investigating committees at work for a considerable period of time, to say nothing of the measures proposed in the state legislatures that have never seen the light of day.

Our present system may be inadequate. It may penalize some perfectly good and worthy measures, but it equally keeps down the product to the minimum, and legislation is one product that we shall hope never attains mass-production proportions.

Fewer and better laws should be the slogan of municipal, state and national governments. Laws designed to assist not the few but the many; laws that are so logical and correct that enforcement is possible—if not probable. "Time may be an element," but time is the thing that most politicians have most of, and the rank and file of us can wait for the legislative mills to grind in our behalf.

Our Radical Supreme Court



WHEN Charles Evans Hughes was proposed by the President for Chief Justice of the Supreme Court, this country witnessed a most disgraceful performance of our national congress. Mr. Hughes was subjected to unwarranted and undignified criticism, and the President to serious embarrassment. The major charge was that Mr. Hughes, in his capacity of lawyer, had served corporations wielding vast power; it was also claimed that he was a "radical." Mr. Hughes now has been on the bench for a sufficiently long period to gauge the validity of these indictments. Is he serving on the bench as a "tool of the interests?" His recent decision concerning the Indiana law taxing chain stores would seem to refute that. Is he a radical, or liberal? Years ago, when Governor of New York, he established a precedent that should answer that question. When the legislature was excluding from membership in it Socialists who had been duly elected, Mr. Hughes protested such exclusion and was promptly termed a radical. We have every reason to believe that in his position on the Supreme Court his decisions will continue to be as fearless as his past record shows they have been.

But why all this talk about the Supreme Court being "reactionary," "radical," "liberal," and whatnot? Any serious perusal of the decisions of the court will show each member in first one classification and then the other. Members of the court have been called "radicals" only to have the other extreme hurled at them because of some decision that did not meet approval. It has depended quite largely upon the goring of the ox.

Upon one thing most people will agree: Judges of this august body should be of the highest caliber, open-minded, cognizant of social changes, and ready to adapt time-honored maxims to our altered modern civilization.

And perhaps as important as these is the necessity for reasonably speedy action by the court. Men must know where they stand within the law, and any lengthy holding up of a decision which involves our business life, seriously hampers our progress. Mr. Hughes' record in expediting the work of the Supreme Court is enviable and puts to shame those who objected to his elevation to this, our highest tribunal.

Rampant Paternalism



TAXATION, both direct and indirect, has its source in the people. When equally distributed and honestly administered, the citizen receives full protection and full value for his contribution toward the cost of government; but when erratically assessed and inefficiently expended, taxation becomes a burden so heavy that industries sicken and die; whole districts become impoverished; and capital no longer seeks investment in those industries or areas.

The subject and object of taxation and its amount should be governed alike by the public need and by public policy, in order that industry may be encouraged, and increased assessment values created.

But of recent years an epidemic of tax spending agencies and useless commissions have encroached the field, combining political and social services with the economic administration of government until these activities exceed in their demands the legitimate expenditures of administration.

Whenever the people, free from all paternalism and dependent solely upon their own resources and the natural working of the law of supply and demand, evolve their own channels of trade and the markets of their choice, business and government function with the least friction. Any attempt to alter this condition disrupts the entire economic machine.

Of recent years, however, there has arisen a school of thought which endows public officials with supernatural powers as custodians of wealth, morals, comfort, employment and prosperity.

Already one day's labor in each week, for our entire population, is contributed to the expense of government. Increased taxes and larger borrowing all lead to constantly rising taxation in years to come; while the people ignore the inevitable toll of the future.

Only by restraining public officials from their present prodigality, and by refusing to concur in continued paternalism of government can the orgy be stopped.

Let the government:

- (a) Protect us against foreign aggression;
 - (b) Preserve the peace and regulate commerce between the States;
 - (c) Provide and maintain a stable and elastic circulating medium;
 - (d) Enforce the decrees of the courts;
- and it will have performed the major portion of its rightful functions.



One of the usual parades of workers. Note the militia on the side lines.

By William H. Grady*

COMMUNISTIC RUSSIA

*The viewpoint of
an American mining engineer*

A PROMINENT American citizen, who is an outstanding educator, speaking of the Russian situation, recently said, "To my mind, the only competent judge of Russia is an American with an alert, inquiring mind, who rates somewhere in the middle of the average economic power; an American who owns his home, and perhaps an automobile; who has a growing family which he would not like to see collectivized; but who has no coupons to clip and no means of income but his hands and his brain."

I do not know that I qualify under the above specifications for "Mr. Average Man," but I believe that I closely approach it. I am an engineer, and by the very nature of his training an engineer must have an "inquiring mind." It is probably unimportant, as to the balance of the description, that I have the family and the children, minus the coupons!

As one of a commission of 15 engineers specializing in different branches of engineering, I signed a three-year contract as a coal mining specialist for Russia, and sailed in January, 1930, to assume my duties. I returned to America late in May, 1931, the immediate cause of my return being Mrs. Grady's dismissal from Russia by the Soviet authorities.

Before having been in Russia long I wished that I were home. I must have

* Consulting Engineer, New York City.



A typical Russian scene
Foraging for bread

William H. Grady



Editor's Note: Mr. Grady is a well-known coal mining engineer. His experience in Communistic Russia is perhaps more vivid than that of the average American engineer in that country, because of his difficulties with the Government and his determination to study conditions in spite of those difficulties. We present his views as an unvarnished chronicle of conditions as he found them, and ask our readers to give serious consideration to the possibility of the growth of this same system in our own United States.

radiated my disgust and horror of all things communistic because Director of Trust, Schachtstroy, Chatchaturianz, requested my dismissal on June 4, 1930.

I DECIDED that I would stay on. I was very much interested in their coal mining industry, particularly anthracite, in relation to our industry here, with which I have been identified since early boyhood days. I also wanted to study Communism in its lair. I played subterfuge, unscrupulously resorting to the tactics they had used. I appeared before the Supreme Council of National Economy in Moscow. I fraternized with the Communists. I ate and I slept literally out of the same pot and on the same cot with their much vaunted, their much dreaded secret service men, the Ga-Pa-Oo.

For many months we traveled European Russia, Mrs. Grady and I, entirely by ourselves, unhampered by an interpreter. Much of the time Mrs. Grady could not accompany me because of prohibitive weather conditions. Often for days I was without a companion or associate, coming in contact with all classes and conditions of peoples and things. I sat in the councils of their management studying their data on cost, income, tonnage and all of the various factors of control that enter into the management

of what one may properly say is the largest coal mining trust in the world.

So when I refer to our specification of the "average man," I believe I have had the opportunity of procuring unbiased information or at least an insight into the workings of the Soviet system, sufficient to form a sound opinion of it.

Upon returning from Russia, and learning of the misinformation and of the subtle and most insidious Communistic propaganda that is being spread in America, it seemed to me but a duty of citizenship, to acquaint engineers in particular and Americans generally with Communism as it is practiced in Russia.

It is only fair to say, however, that when I went to Russia I was interested only from an engineer's point of view. I had thought little about Communism, and what thoughts I did have were favorable. I did not understand then, as I afterward learned, that the Communists were robbing the peasant farmer—the man with a cow, a horse, a pig or two and a dozen chickens, an acre or so of ground, a home and a wife and family—of their life-long labors and their homes. I did not understand then, as I afterward learned, that the Communists were literally slaughtering hundreds of thousands of their fellow countrymen who had fought for freedom, "peace and the

land" in the October Revolution, or that other hundreds of thousands of their countrymen were being sent into Siberian exile, men, women and children.

Their only crime was that the Revolutionists of October desired the fruits of that revolution with "peace and the land." Many hundreds of thousands of others suffered the same fate, whose only crime was that they had exercised thrift and acquired in a minor degree the intelligence that comes from elementary education. How many were killed outright or died in exile, of starvation or otherwise, will probably never be known. Competent observers state it as millions.

WHEN one considers that literally hundreds of thousands of Russian men, women and children have had their lives snuffed out by Communists since the October Revolution, and that hundreds of millions of Russian people in this and the next generation are having and will have their lives adversely influenced by communism, it is considered that the price paid far exceeds any possible good that may be expected to accrue from the "greatest of all human experiments." The "experiment" of trying to raise the average of intelligence of the peasants and workers of a nation of 160,000,000 by literally killing off all the intelligent people of that nation. Surely you will say those words are not true. But they are. That is the "human experiment."

In the Soviet Union there are 200 nationalities, speaking 150 different languages. There are about 160,000,000 in population. Of that population, less than 3,000,000 are Jews, probably about 1,000,000 are descendants of the old German colonists. Thus about 25 percent of the population is Asiatic, and many more are of Asiatic strain. Russia lies between Asia and Europe, so that by geography and population, one may well think of Russia as Western Asia, not Eastern Europe.

Mark this—of that 160,000,000 population, less than 2 percent are Communists.

Those Communists boast, "We can conquer the universe. We have done with the kings of the Earth."

Russia is the largest continuous domain in the world. It exceeds Canada, Mexico, and the United States combined, in population, area, richness of soil, mineral wealth, and forest region.

Its climate varies between 90 degrees below and 120 degrees above zero, Fahrenheit scale. There are places on the steppes where if mercury were used it would freeze in the winter and burst out of the top of the thermometer in the summer. These extremes of climate bring about a lassitude and passivity of body and of spirit. In the south the people counteract with sleep. In the north they hibernate. When winter



One of the new Soviet industrial towns. Very attractive from the exterior, but, says Mr. Grady, you should see the interior of these houses

comes, even in the new apartment houses where by decree, the officially approved temperature is 45 degrees Fahrenheit (as compared with our American standard of 72 degrees Fahrenheit) the Russians seal up and putty every crack, cranny and window. I have slept on two small tables in a room, where there were four cots, two to a cot, men and women mixed, the reason being that there was no room left for one to sleep on the floor.

These extremes of temperature violently affect the character of the people. They lack balance and run from one extreme to another. Five hundred years of oppression under Czarist rule has prepared the Russian for that greatest oppression and slaughter in all their history, the Five-Year Plan and the liquidation of the Kulak. Endurance is indeed a virtue—the *supreme* virtue to a Russian. You, who study the influence of environment on character—do you wonder that in a country so wild and fantastic, the Communists have ideas, wild and fantastic?



Gosprom, Kharkov, Ukraine—The "largest" office building in Europe! A modern office building built by the workers for the workers

Pravda, the official newspaper of the Communist Government in Moscow, in the issue of September 9, 1928, printed this:

"The world-wide nature of our programme is not mere talk but an all embracing and blood soaked reality. It cannot be otherwise. Our ultimate aim is WORLD Communism; our fighting preparations are for WORLD revolution, for the conquest of power on a WORLD-WIDE scale and the establishment of a WORLD Worker Dictatorship. Therefore, the programme of the Communist International is obligator ON ALL ITS SECTIONS."

Not the least, in fact, the most important, of these sections is that largest and most hated of all sections, the UNITED STATES.

That same official mouth-piece of the Communist Government in Moscow, in the issue of August 29, 1929, printed this:

"The Five-Year Plan is an important part of the offensive of the proletariat of the world against capitalism; it is a plan tending to undermine capitalists, stabilization; it is a great plan of world revolution."

Accepting this definition of the Five-Year Plan it is to be regretted that one must admit that the Five-Year Plan is being vigorously prosecuted and effectively felt all over the world. Let no one ever think, press reports from Moscow to the contrary notwithstanding, that there has been the least abatement of the plan or efforts for World Revolution on All Its Sections.

The current news from Moscow, in the

FIVE-YEAR PLAN AND QUALIFICATION OF LEADERS

THE subtle, insidious, Communist propagandist will tell the foreigner, as they told me, that the Five-Year Plan is designed to coordinate Soviet Union agriculture and industry, and direct them toward a series of definite objectives whose achievement would give the Soviet Union high rank among the producing, manufacturing and exporting nations of the world. Notwithstanding that the average of intelligence of the Soviet Union, of the peasant and worker, has been measurably raised, mathematically speaking, in the world laboratory, by the "interesting human experiment" of actually killing off millions of every class of society, peasant or worker, aristocrat, or intelligensia, scientist, or professor, clergy or independent farmer and the merchant, that is not a Communist, the average of intelligence is still too low for comprehension as to what is meant by giving the Soviet Union high rank among the nations of the world. So that the Communists may understand just what is the purpose of the Five-Year Plan,

Icon	Label	Rating
Авиация	ПЛАВА 5	136%
Паровоз	ПЛАВА 21	107%
Автомобиль	ПЛАВА 14	103%
Конная повозка	16 ПЛАВА	75%
Оxen cart	ВОСТОЧНИК	62%
Черепаха		
Улитка		
Человек на палке		

Bulletin board showing "social competition" among the workers. Note that those under the airplane rate 136%; those under the locomotive 107%; under the automobile 103%; under the horsedrawn carriage 75%; under the ox cart 62%; while those under the tortoise, the snail and the man riding a stick chained to a post are given no rating

Moscow Russian daily papers, official organs of the Communist Government, commenting on the "Hoover Moratorium" and the "Woll Plan" say nothing will be accomplished short of world revolution.

The execution of the Five-Year Plan is being carried out by terrorists, men who know nothing about business. And the waste and loss of life are appalling. My immediate contact with them while in Russia, was through a man—a monster—named Deutsch. Deutsch was a Nihilist, an anarchist, who had spent 10 years in America. Chosen to head the vast coal industry, to use their own words, because of his "iron willed achievements." Here are his achievements: He formed and was the third member of the "troika," who together with Dserjinsky and Peters organized the famous "Cheka," the predecessor of the now equally famous G. P. U. The duties of these men are to search, arrest, try, judge, convict and execute in all cases of counter-revolutionary activity. And what is "counter-revolutionary" activity? The law says, "when in doubt let your revolutionary conscience be your guide." Last winter it was impossible to freely obtain coal for ordinary household use and heating, at the very mouth of the mine, even though thousands of tons of coal were stored, ready for export. At one of the mines, Mine No. 5, a resolution of protest was sent to the central committee of the Communist Party at Moscow. Deutsch dissolved the committee and arrested all its members. They were charged with counter-revolutionary activities. If the usual punishment was carried out, their

reward was Death. This man was typical of all these leaders.

FORCED LABOR AND UNEMPLOYMENT

LET me submit to you these decrees of the Commissariat of Labor on November 5, last:

"Skilled workmen refusing work offered them are put onto unskilled heavy labor, and if they refuse this are struck off the employment register."

As only those on the register can draw food cards the power of the government over the workmen is absolute. Free labor as we understand it does not exist. Another decree, April 7, 1931:

"Those who agree (*agree* is the word they use, but it should be *are compelled*) to work overtime for nothing are promised (only promised) extra food rations in the general shortage of commodities, while those who do not work fast enough are to have their food rations cut down."

Aversion to work may be said to be more than a human trait. Aversion to work is the greatest obstacle to be overcome in the success of the industrial-

ization of Russia. Stalin, Dersjinsky, Zinoviev and other Soviet officials have tried hard to overcome this aversion to work on the part of the peasant and worker. Those peasants and workers counter all these exhortations to work, with the proposition: "But are not we the owners; you yourself have said so. . . . No longer are we the workers; we are the directors. . . . We sit around the conference table."

When in conference in Shachta, in February of this year, I gave the owners of the mines, i. e., the workers and their "employees" assembled, i. e., the management,* some comparative figures between units of performance of Russian workers in the coal mines of the United States, and in the Russian mines under Russian management, as against Communistic rule, with entire absence of management. They countered with the proposition "please understand, Mr. Grady, the figures you quote cannot be used for comparison. You refer to the performance

*NOTE.—You will please understand from the Communist that the "workers are the owners." The "management" are the "employees" of the workers. Furthermore please don't ever forget it if you do not wish to be frowned upon, and worse by the Communists.



of the Russian workmen under capitalistic domination. That can never be again in the U. S. S. R. We are the owners." "We sit here around the conference table." "We do not work." Then I asked further: Who then is to do the work? How is the work to be accomplished? I was told, "Sto percent mechanization." Sto is the Russian word for 100.

There are laws and decrees "allocating" all labor in Russia. But laws are difficult to enforce 100 percent, even here in America, if they are not good laws—not good common sense. Most laws in Russia today are not good common sense.

ALL industrial discipline has broken down. Labor turnover frequently amounts to 100 percent a month in some industries. In the case of the coal mines, where it was my duty to be familiar with the facts, men frequently escaped from the mines. They did not even claim their pay. In all railroad stations outside such centers as Moscow and Leningrad, and there to a lesser extent, there are throngs and throngs of peasants and workers hoping somehow to escape from that lot in life that the Communists have imposed upon them. I have waited anywhere from 18 to 36 hours for trains in such railroad stations as Kharkov and Rostov-on-the-Don when it was literally true that one could not walk about the waiting-rooms because of the mass of humanity, peasants and workers, lying, sitting and waiting for a train to take them somewhere, anywhere where food and less unbearable living conditions might be found.

I think that it would not be over-estimating, or guessing, to say that 30 percent of the peasants and workers are out of employment constantly because of this labor-turnover. Efficiency of the workmen would increase many, many fold if they were given a reasonable amount of food and more bearable living conditions. Increased productivity of the worker, or continued and ever increasing lessening in productivity of the worker may well spell success or failure to the Soviet regime. It is the most hopeful sign of collapse within all Russia.

What Do the Peasants and Workers Think About It All? What Do They Think About Stalin? One can best answer that question this way: One will agree that when our national presidential campaigns are on, our propaganda is



Former thrifty peasant farmer, now "washer-woman" for American engineers

on the part of what remains of the former intelligensia.

THE RELIGIOUS POSITION

"TOVARISHE!" "Tovarish!" "Bezbozinki!" "Vive gatorye?" is their cry. Those Russian words mean "Comrades! Comrades! You who are of the League of the Godless. Are you ready?" And their answer is, "Da. Da. Gatorve." Yes, Yes, Ready. "Let us now conquer the kings of the sky. Our task is to destroy all kinds of religion, all kinds of morality." And they proceed to demolish and destroy.

I have seen some of the most beautiful examples of church architecture in the world dynamited and destroyed. I hold photographs of them right here in my hand, taken by myself, interior and exterior before and after demolition. I have seen bells hurled from church steeples and shattered on the ground. I saw a clergyman, tired and overwrought, and weak from hunger, attempt to get on a street car, five young Communists spit on him, and one kicked him in the chest, and he fell off the car and swooned into the gutter. Religion, Christianity, family life, morality are all one. They are banished from Russia today.

The teachings of Christ, family life, truth, and honor would not have stood the test of time had they not been right. They are all swept away by the Communists. One of their most striking cartoons, which may be seen in poster form everywhere in Russia today, is a factory worker sweeping Christ into the gutter.

quite complete. Everybody should know who are the candidates for president, at least, and what are the issues. Well, the Russian propaganda is quite as complete but there are large groups, who, I honestly believe, do not even know that the Czar is dead. You might say there are three strains of thought: no thought at all; the fanaticism of the young communists who are for the whole project, body and soul; and a feeling of resentment and disgust

Out of our idea of family life has grown that treasure which we, of all the world, alone possess. I refer to our American standard of living. In my opinion as certain as night follows day, in order to maintain our standard of living, our high wages, and the institutions set forth in the preamble to our constitution, the Russian people must be freed from Communism or we will be engulfed by Communism.

STALIN'S NEW ECONOMIC ERA

PERHAPS nothing more blatant has come out of Moscow than the proclamation of Stalin on his "New Economic Era." We should hold the "public relations counsellor" (whose name is best left unmentioned) of the abortive communist government for the faux-pas, for faux-pas it was. When the truth becomes public, the statement will have done much to show up Communist propaganda in America.

Stalin knows nothing about business. He is necessarily in the hands of his "Gosplan" or planning Commission—and in the hands of his "public relations counsellor." Stalin should not personally be blamed for the unfinished, frequently baffled, frequently reversed, abortive plan of government that paralyzes in a hundred different ways, which has been foisted on the Russian Revolutionists of October. The "Gosplan" commissioners are theorists, wholly impractical. One might almost say mentally unbalanced. They and those with whom I came in contact on the Supreme Council of National Economy, are responsible for the untold waste and suffering of the millions of Russian people.

In Stalin's New Economic Era are six points of departure. Leaning toward capitalistic practices, and human acts are noted by the "public relations counsellor" and handed out to the public. It will be sufficient to refer to the order as it affects their coal industry, with which I am particularly familiar.

Immediate reorganization of the important Donetz Basin coal fields along lines encouraging individual effort was ordered by the Soviet authorities. Russia is a hot subject; it is always undergoing reorganization. The order states among other things that piece work shall be extended so that the better qualified miners and other workers will be paid according to their merit and not as they have been, everyone on the same basis regardless of whether their work was good or bad.

Purely Bunk! ALL BUNK! Meant for the consumption of the capitalistic countries. The report, is regarded as of "vital significance." But of much more vital significance is the fact that "Stalin's Economic Era" pronouncement

comes at a time when the capitalistic world—and the Communist world—are giving thought to the "Hoover Moratorium" and the "Woll Plan."

WHAT there has been and now is, a complete dissection and classification of all labor in the Donetz Basin coal fields, with piece work and wage scales in full effect is known to everybody familiar with the coal industry. Few, if any, Americans are familiar with that industry. My daily work made it necessary for me to be intimately familiar with the piece work rates, wage scales and union agreements.

I have here before me, on my desk, an original copy, in the Russian language, of the **COLLECTIVE BETWEEN the DONUGOL and the ALL UKRAINIAN COMMITTEE OF THE UNION OF MINERS**, which applies to all miners in the Donetz Basin coal fields and further south in the Caucasus. This is a continuing agreement, not unlike our agreement known as the 1902 or Roosevelt agreement between the anthracite miners of Pennsylvania and the operators in the anthracite fields of Pennsylvania. A perusal of this Communist agreement shows that there are 322 classifications of occupations in the Donetz Basin coal fields and a wage scale varying between 4.00 rubles to 1.20 rubles per day. The shift or day is generally an eight-hour day, but some occupations call for six hours per day, more particularly that of what we would call a "miner." They refer to this occupation as a face worker. Wherever practical piece work has been introduced, or "a car" or "a yardage" rate. All face workers are on piece work. Face workers are the highest paid of all the workers about the mine. They usually receive 4.00 rubles per task performed. The task is set by the "mine committee" jointly, a technical man and a Communist or representative of the laborer. The Communist has long since ceased to be a representative of labor. He is now a representative of Stalin and the Party. The face worker's task is usually the hewing out of the solid a certain square metre or more of coal. The only tool is a very poor pick. On "mechanized faces" power-driven puncher picks are used. The task set is such that if everything is working like clock work an able face worker may perform the task in six hours, but if anything goes wrong (and many things do go wrong, which are utterly beyond the face worker's control) the face worker *must complete the task without extra pay for overtime*. In the wage agreement to which I refer above "pump runner's" wages are classified according to the capacity of the pump. There are five distinctions made and the rates in rubles are 2.50, 2.20, 2.00, 1.80, 1.60. The shift is eight hours.

LIST OF WORKMEN OF KALININSKY MINE DISTRICT IN EFFECT YEAR 1930-1931
Daily Force Account Sheet

Qualification	Wages in Rubles per Task	Number Employed	Qualification	Wages in Rubles per Task	Number Employed
Facemen	4.00	273	Helpers, machinists	2.20	3
Timberers	2.85	86	Levermen	2.20	3
Drillers	2.85	15	Helpers, levermen	1.60	2
Loaders	1.60	13	Haulage men	1.20	36
Rockmen	1.80	8	Elevator operators	1.20	2
Cribmakers	2.20	19	Drivers	1.20	4
Runmen	1.80	38	Rock pickers	1.20	36
Packers	2.20	3	Loaders	2.20	34
Rockmen	2.00	48	Lump breakers	2.20	7
Team Drivers	2.20	41	Stokers	2.20	17
Cleaners	1.35	11	Dust men	1.45	13
Locksmith	2.85	3	Boiler cleaners	1.80	3
Topmen	2.20	9	Apprentice gang .....	...	25
Helpers topmen	1.80	5	Machinists .....	...	15
Drivers	1.60	14	Electricians	2.00	6
Switchmen	1.20	8	Telefonists	1.60	3
Stable men	1.45	8	Turners	2.50	5
Timber deliverers	2.00	9	Blacksmiths	2.00	5
Hoistmen on timber delivery	1.80	2	Helpers, blacksmiths	1.50	5
Ventilation Carpenters	1.80	3	General laborers	1.45	35
Doormen	1.20	2	Coachmen	1.45	10
Blastmen	2.60	5	Surface stable boys	1.35	4
Watchmen	1.35	4	Saddle men	1.80	1
Farmen	1.35	3	Carpenters	1.80	6
Pumpmen	2.50	3	Joiners	1.80	2
			Bath attendants	1.20	12
			Surface watchmen	1.20	13
			Miscellaneous .....	...	146
			Total		1,191

EXCERPTS FROM AGREEMENT BETWEEN DONUGOL AND THE ALL-UKRAINIAN COMMITTEE OF THE UNION OF THE MINERS, 1930

Brief Specifications	Wages Rbla. Kopeks	Length of working day in hours	Days of vacations during the year	Specification of working clothes and length of their use
Cameron operators (underground). For pumps with capacity up to 2,000 vedro per hour (1 vedro=approximately 5 gallons)	1 60	8	24	For mechanics working on electrically operated discharge pumps in closed chambers, also in dry places outside of chambers.
For pumps with capacity up to 4,000 vedro per hour	1 80	8	24	Rubber gloves during working hours.
For pumps with capacity up to 7,000 vedro per hour	2 ..	8	24	For mechanics, working on discharge pumps on wet job.
For pumps with capacity up to 10,000 vedro per hour .....	.. ..	..	..	Waterproof suit with hood —1 year.
For pumps with capacity over 10,000 vedro per hour	2 50	8	24	Rubber gloves for electrically operated pumps during working hours.
For pumps of suspended type.....	2 20	6	24	Leather boots—1 year.
Workmen in underground galleries.....	1 35	8	24	Tarpaulin gloves until they are worn out. Boots in wet places during working hours.
Stone-breakers	1 45	8	12	Tarpaulin aprons, 6 months. Tarpaulin gloves until worn out. Spectacles, when necessary. 2 rope shoes, 2 linen puttees until worn out.
Inspectors for inspection and small repairs of underground cables.....	1 80	8	24	
Car pushers	3 20	6	1	Same as for sled workers.
Repair men	[1 35 1 60 1 80	8 8 8	12 12 12	
Conductors, on surface	1 60	8	12	Conductors of railroad trains —felt boots during winter
Conductors, underground	1 80	8	24	—2 pairs.

Surely it will not be contended that there is no piece work here or that men heretofore have received the same basis of pay.

That you may have some conception of just what that wage scale means I will say that a ruble is roughly worth 50 cents, when the Communists require an American to take part of his salary

in rubles. But rubles can be purchased for 25 to the dollar or 4 cents apiece. So that you may say that pump-runners receive wages as follows in dollars and cents: \$1.25, \$1.10, \$1.00, 90 cents, 80 cents, or if you prefer, \$0.10, \$0.09, \$0.08, \$0.072 and \$0.064. Everybody agrees, nowadays, I believe, that wages should bear some relation to the cost of



A typical street scene. A Russian farmer and his wife sitting on the curb eating their daily rations of black bread and dried fish

living and any consideration given to a statement of earnings should show indices of food and other items. Shoes, such as you know them would sell for \$150.00 per pair, and other items in proportion; cocoa at \$5.00 per pound and other items in proportion. Having seen what the men eat and wear, I consider the lower value of the pump-runners' wage is better for comparison with American wage scales. The Communists handle these matters in true Communist style; they call everything bourgeoisie and then discourage its use.

COMMUNISTIC ACTIVITIES IN AMERICA

BELIEVE me when I tell you the Communists hate you. They *HATE* you. They have said to me more than once, "Grady, be our comrade; join our party. Until you do, the best looking part of you is your back." No rancour; simply a statement of fact. You who are our artisans, specialists, industrialists and our financiers, helping to build up Communism, in the not distant future, Communism may tear you down. The Russians would glory in a country such as ours, they who are the October Revolutionists, not the Communists.

Communist propaganda is subtly, insidiously working from within everywhere in America. Generally it is less easily exposed than the joint order signed by Stalin to which reference is made

above. Gregory Zinoviev, as president of the Communist International, sent the following instructions from Moscow to Communist agents in the United States:

"The Central Executive Committee of the Communist Party of America must direct its particular attention to the progress of the strike of the miners of America."

"Agitators and propagandists must be sent to the strike regions."

"It is necessary to arouse striking coal miners to the point of armed insurrection."

But where greater danger lies is among the Communists who are leaders of thought, as school-teachers, college professors, editors, authors, lecturers, business and professional men. Never before was the saying "eternal vigilance is the price of liberty" more true than it is today.

BUSINESS WITH RUSSIA

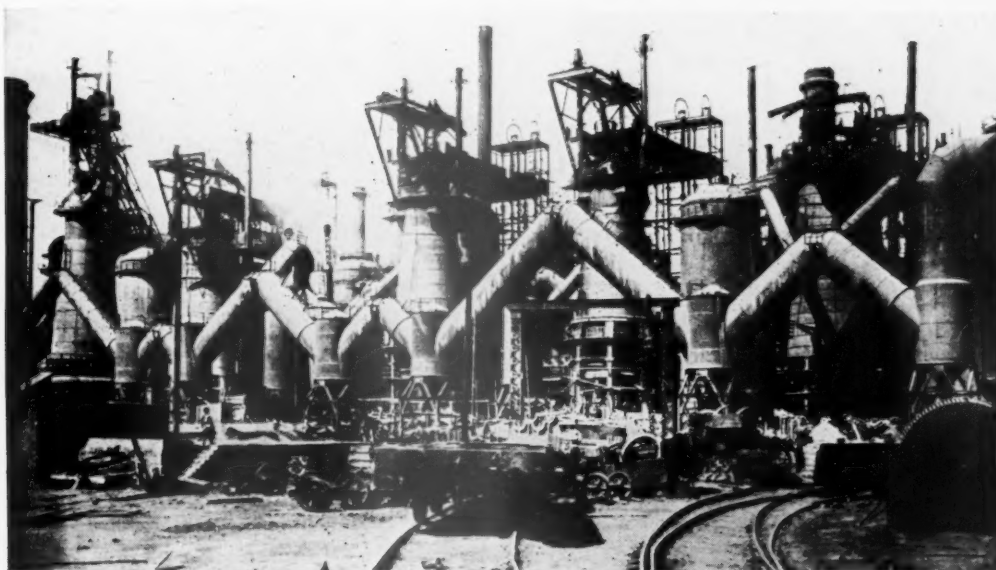
SHOULD we export to Russia? I feel very strongly that we should not. We may be able to protect our markets against Russian products, but Europe cannot if we help build Russia. We should help build Europe, especially

The success of the "Five-Year Plan" depends upon mechanics such as these

Poland, Germany, and England, not Russia.

We can only understand Russia by approaching the subject with an open mind, and then only with difficulty. Many things Russian and with respect to Russia are so contradictory within themselves. For example, Calvin Coolidge has said: "I do not propose to barter away for the privilege of trade any of the cherished rights of humanity." Yet we find many of our strongest industries falling over each other for the privilege of trading with the Communists; and as Lenin has said "to commit suicide for a profit." In all Europe there is the spectacle of those seasoned industrialists, near to the seat of the debacle, whose intimate knowledge of the Communists causes them to refuse to extend the Soviet Government credit. They say, "Your Soviet paper is not negotiable." Nothing daunted the Soviet Government working through their "cells" within the high offices of Europe's several seats of government will endorse the Soviet paper up to as much as 75 percent of its face value. They then plead that the industrialists accept the Soviet business, give work to the unemployed, and offset the depression. Insidious, subtle propaganda. I believe fully in the protection of our industries. But what would you think of a party in power that built its tariff walls so high that nothing could come into the country except through the politicians in power? That is the Communist Party in power in Russia today. I have a friend, a prominent business man from Chicago, who was lying sick for want of food in a room in Moscow.





A modern steel mill and blast furnace operated by the gigantic Southern Steel Trust of Soviet Russia

© Henry Miller.



Instructing workers in the use of modern machines and tools

One of the boys told him he needed some food and a bath. So he telegraphed to Berlin for some palatable food and two cakes, *not crates*, of soap. He could not buy food or soap in Russia. I forget the duty he was taxed on the food; it was enormous. But the duty on the soap, two cakes of American made soap, made the cost \$20 per cake, and he had to take the soap in order to get the food. Yet Russia exports boat-load after boat-load of Russian soap, especially to Wales, but elsewhere also, and it enters *duty*

A modern mining town rising on the Ukraine Steppes, the Donetz Basin coal fields



free. Russia would be incensed if a tax were imposed.

No American citizen—be he artisan, specialist, industrialist or financier—doing business with Russia today, can be ignorant of the basic fact (which fact does not admit of any argument), that the avowed purpose of the Russian Government is to overthrow, *by force*, and destroy our Federal Government, with the elimination of existing constitutional forms and foundations.

RECOGNITION OF RUSSIA

I HAVE great sympathy for the rank and file of the Russian people. I feel we should help them in every way possible. But we do not help them when we build up and finance their present abortive form of government.

The recognition of the present Soviet Union carries this with it—an effort on their part to destroy all the religious, social and political institutions in the

United States as they exist at this time, and many other revolutionary designs.

What do they offer us in the place of our present civilization? Rape, murder and an unfinished, frequently reversed plan of government, which paralyzes in a hundred ways. They themselves admit it holds nothing for the present generation. The future? Only promises. They have broken every promise they have ever made. They promised the peasants the land, "Peace and the land." They gave the peasants war, pillage and massacred millions. It is true that the Czar held title to the land, but the peasants had the crops. Today, those peasants who have not been massacred have neither the land nor the crop, which they themselves produce. Stalin, the Communists take all.

I hope the time will never come when our statesmen will so far forget or dishonor themselves and their country as to allow the politicians to stampede them into recognizing the present Soviet Union.

Modernized Mining with TRACK and CATAPILLAR Machines

By G. B. Southward

The development of mechanical loading with mobile machines has crystallized into two distinct trends. One is with track-mounted equipment, while the other is with catapillar tractors. Both of these types are designed to compete with each other, and while their fields of adaptability will always overlap, they each have certain advantages which will tend to make each type predominate for certain uses. The track-mounted machines, designed for rapid movement, are particularly suitable for a mining system that has a large number of narrow working places. The catapillar mounting with its more flexible movement and greater reach is adapted to loading wide rooms, with either a single or double track for the mine cars, and to reduce the time needed for traveling to a greater number of working places.

Long face mining with mechanical loaders is certain to come more in use in the future than it has in the past. The present development with track and tractor machines indicates that each type will have an application for working long faces.

THERE are submitted with this article two reports showing the machine operating data on two mines using mechanical loaders in the room pillar system. Each report shows the labor and equipment used in connection with one loading unit. These mines are located in different mining fields, in different mining states with entirely dissimilar operating seams and labor conditions. They are using altogether different types of equipment for the underground work—mine No. 8 has short-wall cutting machines and catapillar mounted mechanical loaders, while mine No. 12 uses combination track mounted cutting and shearing machines with track mounted mechanical loaders. These two mines are producing approximately equal amounts of coal and with approximately equal records for the man-hours employed per ton, and are selected for this discussion to show that different sets of mining conditions are equally adaptable to machine operation.

The mine in report No. 8 has the best physical conditions of the two. The seam is higher, the roof is better, and the mine cars are 50 percent larger in capacity. These three favorable factors in the past would have been reflected by

a higher tonnage, and a lower man-hour production, but the modern development with machines is overcoming and equalizing physical conditions.

The short-wall cutters and the catapillar mounted loading machines have the advantage of working wider places than can be reached by a machine confined to the track. The track mounted equipments—restricted to narrower working places—have the advantage of a quicker movement from one place to another. The equal tonnage records made in mines 8 and 12 show very clearly that the advantages and disadvantages of each type of equipment can be made to counterbalance each other.

In mine No. 8, the rooms are driven 30 ft. wide; in No. 12, they are only 23 ft. wide. The narrower width in mine No. 12 is offset to some extent by using an 8½-ft. cutter bar, but even with this it requires nine rooms to produce the same tonnage mined in seven 30-ft. rooms of No. 8. The track mounted machines make it possible to do this extra amount of traveling and compete with the wider working places.

The reports on the opposite page show the labor and equipment used for one

loading unit to perform the regular operation for mining the coal and putting it to the main line haulage. They do not show such items as supply delivery, entry track, ventilation and drainage, and in order to make the reports directly comparable, extra items of slate handling are not included. The following summary, taken from these reports, shows a comparison of the man-hours employed per ton of coal produced:

COMPARISON OF MAN-HOURS PER TON

Operation	Mine No. 8	Mine No. 12
Cutting .....	.052	.040
Shearing	*	.010
Drilling .....	.052	.028
Shooting .....	.006	.018
Loading cuttings	†	.006
Machine loading .....	.052	.050
Hand cleanup .....	.026	*
Gathering .....	.052	.050
Timbering .....	.013	.022
Face track .....	.026	.050
Switches	‡	.012
	†.279	.286
Machine maintenance	†	.012
Supervision .....	.006	‡
Total .....	.285	.298

* Not done.

† Included with other operations.

‡ Not reported.

If we eliminate the items which are not shown in both reports, such as supervision and maintenance, we find that the total man-hour per ton record in each of these two mines is approximately equal. There is a slight variance in each of the items compared, but the biggest single difference is in the additional track work done in mine No. 12.

A comparison between these two mines is valuable in showing how different mining conditions can be equalized by different types of equipment and different operating methods. The greatest value of these figures, however, is showing how modernized mining is establishing production records far beyond any possibility of competition by hand loading with anything approaching equal labor rates. These two mines are performing all of the major operations from the solid coal to the main line haulage at an approximate labor cost of one-third of a man-hour per ton of coal produced. Reduce this to dollars and cents and by applying the wage rates paid for hand loading in any field and the present economy as well as the future growth of mechanical loading is demonstrated.

MECHANIZATION SURVEY of The AMERICAN MINING CONGRESS

The American Mining Congress
Report No. 8

Mechanization Division

MECHANICAL LOADING IN ROOM AND PILLAR MINING

GENERAL DATA

Height of seam	- 7 ft; 2 in. slate
Working places	- Rooms 30 ft. wide
Tons per place	- 45 tons
No. places per shift	- 7 rooms
Average tons per shift	- 310 tons
Mine car capacity	- 3.3 tons
No. cars per shift	- 94 cars
Depth of cut	- 6 ft. undercut
Cutting machine	- Shortwall
Loading machine	- Caterpillar mounted

ORGANIZATION OF WORKING CREW

Cutting	- 2 men - operator and helper
Drilling	- 2 men
Loading	- 2 men - machine operators
Loading	- 1 man - hand cleanup
Gathering	- 2 men - motorman & trip rider
Trackwork	- 1 man - tracklayer
Total	- 10 men for full shift
Shooting	- 1 man for 4 units
Timbering	- 1 man for 2 units
Supervision	- 1 man for 4 units

Distribution of Labor Employed

OPERATION	EQUIPMENT	No. Men	Hours Employed	Man-hrs. Employed	Tons Produced	Man-hours Per Ton
Cutting	Shortwall	2	8	16	310	.052
Drilling	Electric - Hand type	2	8	16	310	.052
Shooting	Permissible-fuse	2	1	8	1240	.006
Loading	Mechanical Loader	2	8	16	310	.052
Loading	Hand cleanup	1	8	8	310	.026
Gathering	Reel Loco.	2	8	16	310	.052
Timbering	Wood Posts	1	8	8	620	.013
Trackwork	30 lb. rail-steel ties	1	8	8	310	.026
Supervision		1	8	8	1240	.006

Total man-hours per ton produced .285

The American Mining Congress
Report No. 12

Mechanization Division

MECHANICAL LOADING IN ROOM AND PILLAR MINING

GENERAL DATA

Height of seam	5' coal
Working places	Rooms 23' wide
Tons per place	35 tons
No. places per shift	9 Rooms
Average tons per shift	315 tons
Mine car capacity	2 tons
No. cars per shift	159 cars
Depth of cut	8½ ft. undercut
Depth of shear	8½ ft. center
Cutting & shearing machine	Track mounted
Loading machine	Track mounted

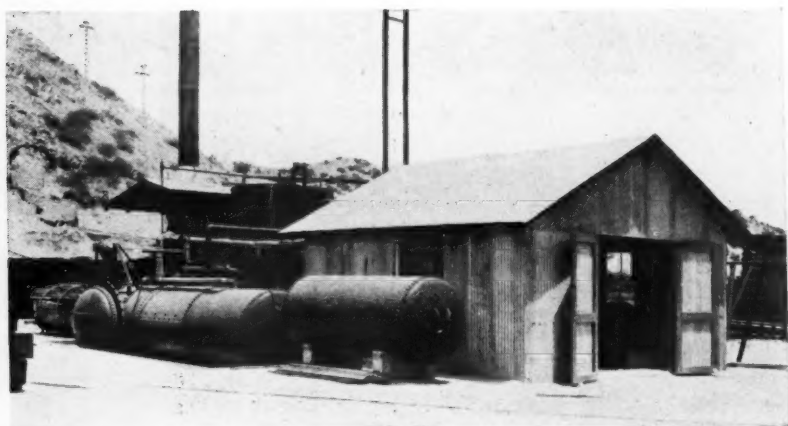
ORGANIZATION OF WORKING CREW

Cutting	- 2 men - operator and helper
Shearing	- - by cutting crew
Drilling	- 2 men - operators
Shooting	- - by drilling crew
Loading	- 2 men - machine operators
Gathering	- 2 men - motorman & trip rider
Face track	- 2 men
Total	- 10 men - for full shift
Timbering	- 2 men - for ½ shift
Switch lay'g.	- 2 men - for 4 units
Mach. main.	- 1 man - for 2 units

Distribution of Labor Employed

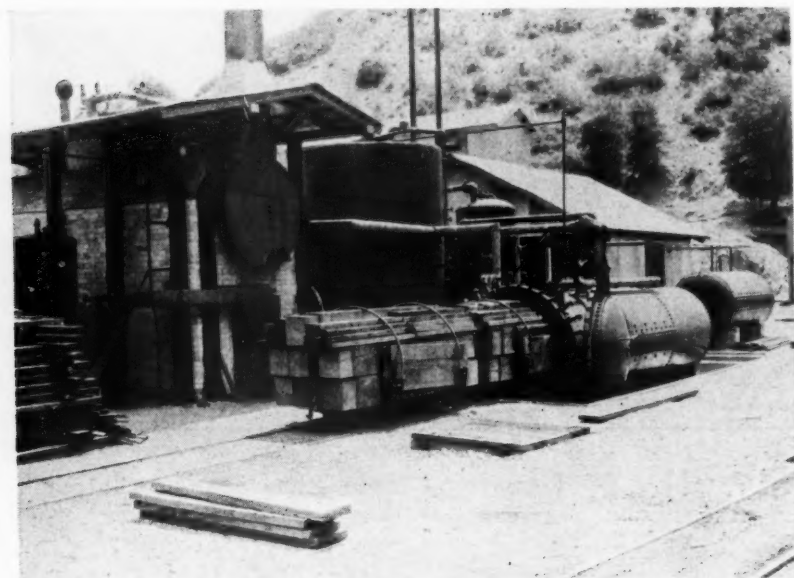
OPERATION	EQUIPMENT	No. Men	Hours Employed	Man-hrs. Employed	Tons Produced	Man-hours Per Ton
Cutting	Track mounted	2	6.4	12.8	315	.040
Shearing	Combination-cutting	2	1.6	3.2	315	.010
Drilling	Electric-Hand type	2	4.3	8.6	315	.028
Shooting	Pellet-Fuse	2	2.8	5.6	315	.018
Loading cuttings	Hand	2	0.9	1.8	315	.006
Loading	Mech. Loader	2	8.	16.0	315	.050
Gathering	Battery Loco.	2	8.	16.0	315	.050
Timbering	Wood posts	2	3.5	7.0	315	.022
Face track	30 lb. rail-steel ties	2	8.	16.	315	.050
Switches		2	8.	16.	1300	.012
Mach. maint'n'e		1	8.	8.	630	.012

Total man-hours per ton produced .298

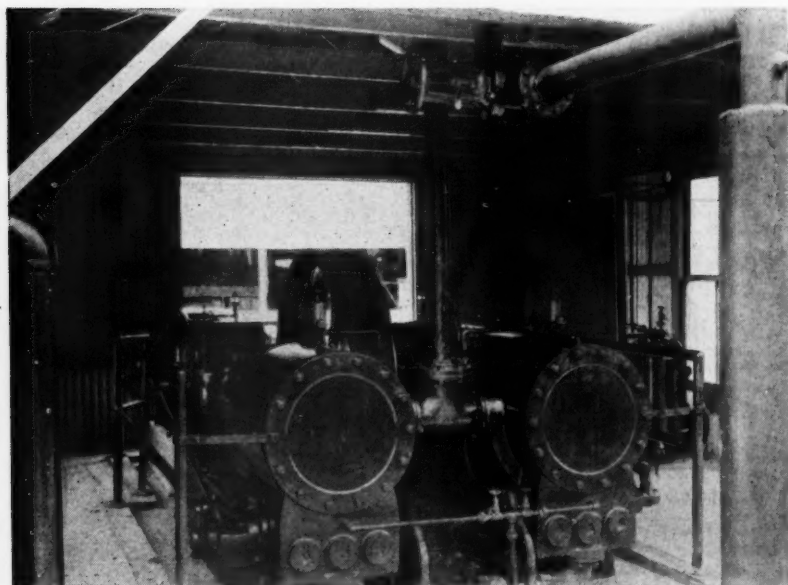


Retort and air receiver, compressor and vacuum pump house

Timber



Loads of timber, retort, boiler and working and pressure tanks



Vacuum pump

PRACTICAL OPERATING MEN'S DEPARTMENT METALS

Practical Operating Problems of the Metal Mining Industry

GUY N. BJORGE, Editor

Treating

at Inspiration

Consolidated

Copper Co.

By

A. C. Stoddard*

ALTHOUGH exact statistics are not available on the total consumption of forest products by the mining industry of this county, the proportion of the total consumption of such products used by the mines of the United States is a large one. Thus prosperous conditions in the mining industry are of much direct benefit to the lumber-producing areas and transportation systems, both water and rail.

Mining in the early days of the Southwest was upon a small scale. Owing to transportation and other difficulties, only higher grade deposits were worked. Timber for mining use was secured from near-by wooded mountain sections.

As transportation facilities became available and treatment processes were improved, attention was turned to the development and mining of various large deposits of low-grade copper ores. In Arizona there are several such deposits and during the past 20 years several

hundred million tons ore of that character have been mined and treated.

While the consumption of mine timber per ton ore mined is relatively small, ranging from .9 to 2.5 ft. b. m., the vast tonnages mined require in the aggregate a very considerable amount of timber, the cost of which is a large sum and an important factor in mining costs. During the six-year period from 1925-1930, inclusive, the mines of the Inspiration Consolidated Copper Company consumed 62,600,000 board feet.

The bulk of the mine timber used in Arizona is Douglas fir from the forests of the Pacific Northwest. The timber is moved by water to Los Angeles Harbor, from which point it is moved by rail to the mines. Water and rail freight account for more than 50 percent of the cost of timber at the mines in Arizona.

Over the past two decades the cost of Douglas fir mining timber has shown a gradual upward tendency. The cost at present is approximately 23 percent over the price in 1914.

IN general, it may be said that timber is used underground to support two classes of openings, i. e., those of a temporary character and others of a permanent nature. In the case of temporary openings, where it is only necessary to furnish support for a short period, the timbers used must have the requisite strength and give warning of failure. Douglas fir possesses both these qualities, the latter being an especially desirable feature of a wood used in mine work. In openings of a temporary character there is no necessity for using treated timber unless the use of a preservative as a fire retardant is to be considered.

A permanent opening may be consid-

ered as one which will be required for use over a period of two years or longer. In timbering drifts or other openings of this type, the weight of the ground to be supported and ventilation conditions must be considered. Treatment of any kind adds nothing to the strength of the timber. Therefore, if the ground is such that failure of timber can be anticipated in a comparatively short time, it would be useless to treat the material. If conditions of ventilation are such that failure from deterioration, in advance of failure from crushing would occur, then it is advisable to use a preservative.

It may be assumed that it requires 150 percent of the original expenditure to replace a set of timber in an opening of a permanent nature. Thus, if through decay, it is necessary to replace a set at the end of 1½ years and again at the end of three years, it is evident that three times the original cost of timbering has been expended in replacements. Under these conditions, if by treatment of the timber the life of the original installation is lengthened to three years, one replacement during that period is eliminated and the cost of treatment and the handling of the heavier treated stock is more than compensated for in increased life.

In computing the advantages of treating timber the cost of the plant together with interest on investment must, of course, be charged to the saving through additional life. Under conditions at Inspiration it was calculated that the investment in a treatment plant would be returned in a year and a half.

WHEN it was decided to erect a plant, the type and method of treatment to be installed, together with capacity required, were given careful con-

* Chief Mine Engineer.

sideration. It was figured that a plant capable of treating 2,000 board feet per charge would be ample in size.

Three types of treatment were considered, i. e., arsenic, creosote, and zinc chloride. In the early years of development at the Inspiration property in 1911, prior to the organization of the present Consolidated Company, it is of interest to note that submergence method of treatment in hot zinc chloride solution was used to some extent. There are no available records covering this early treatment process. The zinc chloride salt used at that time was shipped as a fused product in steel drums and an unused quantity was still on hand at the time the new plant was placed in operation 18 years later. Most of it was in usable condition.

The arsenic compounds were eliminated as unsuitable because the poisonous nature of the preservative would require extreme care in its use. The warm summer weather in Arizona also contributed to the decision to eliminate the arsenic treatment.

Climatic conditions also were a factor in the decision not to use creosote compounds, as in a warm climate this chemical has a tendency to affect the skin and eyes. The additional fire hazard from use of creosoted lumber was the principal reason for eliminating this method of treatment.

Zinc chloride was in common use as a preservative. It is easily handled and requires no special precaution on the part of the men in treating or handling the wood. Aside from protecting the wood from deterioration through decay, zinc chloride acts somewhat as a fire retardant. This treatment, therefore, was decided upon as the most practicable.

DESIGN and erection of the plant was executed by the Mechanical Engineering Department of the Inspiration Company. The equipment is designed for a working pressure of 200 lbs. The cylindrical retort is 5 ft. x 20 ft. 6 in., inside measurements, and accommodates two cars. It is equipped with 30-in. gauge track of 40-lb. rail, pressure and vacuum gauges, thermometer and gauge glasses. The pressure tank is vertical, 3 ft. 6 in. inside diameter, 8 ft. high, and is equipped with steam coil, man-hole in top and safety type protected gauge glasses. A working tank 8 ft. inside diameter and 12 ft. high, equipped in the same manner as the pressure tank, receives the 5 percent zinc chloride solution from the mixing tank.

The air receiver used is of horizontal type 4 ft. x 10 ft. and is equipped with safety valve, pressure gauge, drain cock and manhole in one end. A two-stage air compressor, equipped with intercooler and centrifugal unloader, with piston dis-

placement of 6 cu. ft. per minute is utilized. Actual delivery at 200 lbs. pressure is 42 cu. ft. per minute. A vacuum pump previously used at the company's concentrator was installed. It has two 20 in. dia. cylinders with 12-in. stroke.

The plant was placed in operation during the latter part of January, 1930. From February to December, 1930, inclusive, a total of 522,429 ft. b. m., of various sizes of timbers, were treated. Aside from labor used to load and unload retort cars and to open and close the retort door, one man attends to the plant, which is operated on one shift.

Zinc chloride used per cubic foot treated during the above period was 0.6 lb. The footage treated varied to suit underground needs and ranged from 3,100 ft. to 92,000 ft. per month during the 11 months. Costs, of course, varied in accordance with the quantity treated.

THE cycle of operations covers a period of slightly more than three hours between charges. The zinc chloride solution is made up in the mixing tank. To 48 cu. ft. of water, 159 lbs. of 94 percent zinc chloride is added and dissolved with the aid of air agitation and steam for heating the solution. An air lift forces the solution from the mixing tank into the working tank until a solution height of 7 ft. is attained. A solution height of at least 7 ft. is maintained in the working tank and the solution is slowly agitated with air at all times.

A typical charge is made up of the following:

14 pcs., 12" x 12" x 9'.....	1,512 ft. b. m.
3 pcs., 2" x 6" x 5'.....	15 ft. b. m.
43 pcs., 2" x 8" x 5'.....	286 ft. b. m.
16 pcs., 2" x 10" x 5'.....	133 ft. b. m.

Total 1,946 ft. b. m. or
162 cu. ft.

The retort trucks are loaded with sufficient timber so that there is no danger of pieces floating out from the trucks encircling rings. A charge such as the above is run into the retort, the retort door closed and the door bolts are tightened down by hand. The vacuum pump is started and the retort door bolts are then drawn completely tight with wrenches. The vacuum pump is operated for fifteen minutes and stopped. The valve on the retort is opened to relieve the vacuum and then closed.

Steam is then admitted to the retort and a pressure of 5 lbs. is maintained for 30 minutes. At the end of this period the steam pressure is relieved and the vacuum pump is again started, the vacuum being maintained for 45 minutes. At the end of this period the retort is filled with zinc chloride solution and the pressure tank is filled about two-thirds. Air pressure is then applied to force solution into the timber. A gauge on the pressure tank is used to measure the

quantity of solution taken up by the charge. Approximately $\frac{1}{2}$ lb. of zinc chloride is forced into each cubic foot of wood.

When the desired quantity of solution has been absorbed, the excess solution is passed back into the working tank. A small amount of liquid sometimes remains in the retort and is forced back into the mixing tank with air.

The retort is again placed under vacuum for a 30-minute period, at the end of which time it is opened and the treated charge removed.

Approximate elapsed time from entrance of timber into retort until removal would be 2 hours and 44 minutes.

Two charges of 2,000 ft. b. m. each or 4,000 ft. b. m. per eight-hour shift can be treated using this method.

THE treatment above outlined completely impregnates a 2-in. piece and the larger sizes are impregnated to a depth of 2 in. Air-dried timber before treatment weighs 33 lbs. per cu. ft. and after treatment and before drying weighs 43 lbs. per cu. ft. After about six months drying in the open air the weight of the treated stock is reduced to about the equivalent of the dry, untreated wood, or 33 lbs. per cu. ft.

With the idea of reducing the time of treatment so that more timber could be treated, should necessity therefore arise, numerous experiments have been carried on. For example, during the hot, dry summer months the first three operations were eliminated and the yard-dry timber was placed in the retort immediately following which the zinc chloride solution under pressure was applied. Apparently as good results were obtained as when all operations were completed. Also experiments were made using one-half strength solution and eliminating the first three operations. This method also gave good impregnation results, 2 in. being shown on a 12 ft. x 12 ft. by 2 ft. x 6 in. block.

The experimental work indicates that three charges, totaling 6,000 ft. b. m., can be satisfactorily treated during an eight-hour shift if necessary or required.

Detailed accurate data are difficult of compilation, due to the short period the plan has been in operation. However, from results so far apparent and the experience of others using a similar treatment, there is no doubt but that a substantial saving will be noted in future haulage way repair costs underground at the Inspiration property.

For many helpful criticisms in connection with the preparation of this article I wish to express my appreciation to Mr. F. P. McDonald, mine superintendent, and to Mr. Ray Pollard, sawmill foreman, under whose direct charge the timber-treating plant is operated.

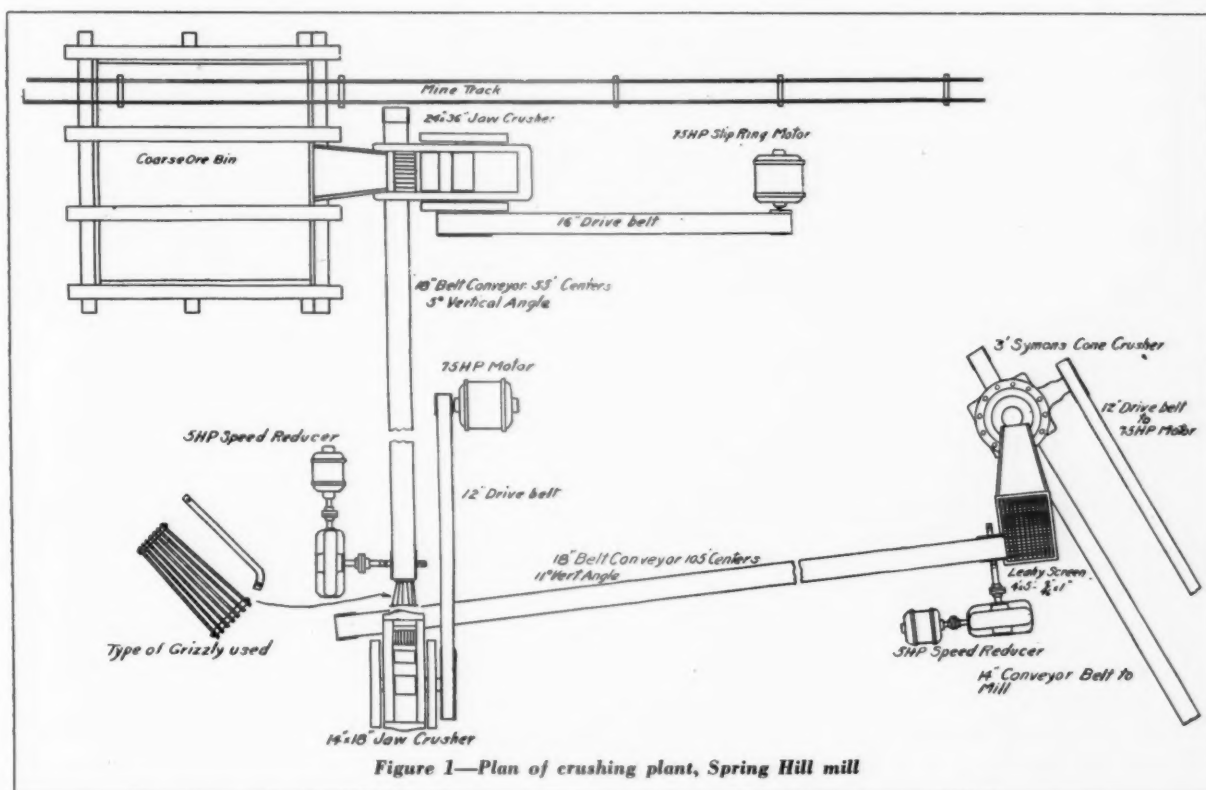


Figure 1—Plan of crushing plant, Spring Hill mill

Mill and surface improvements

at the Spring Hill Mine

By
L. A. Grant*
and
A. L. Pierce†

THE Spring Hill Mine of the Montana Mines Corporation is a gold property situated three miles southwest of the city of Helena, Mont., and near the head end of a north and south gulch known as Grizzly Gulch. At the site of the mine, there is a flat approximately 50 yds. wide in the gulch; a small creek flows down the gulch and furnishes part of the water supply. The mine workings and the crushing plant are located on the east slope above the flat, and the

mill proper is located directly opposite on the west slope at an elevation of 180 ft. above the creek flat. The elevation of the flat above sea-level is approximately 4,650 ft.

Crushed ore is conveyed from the crushing plant across the gulch and up the mill slope by means of a belt conveyor 780 ft. long in two covered sections of unlike pitch, the location of the mill at the elevation on the west slope providing more convenient access to the tailings dams. The dams are located in a small side gulch beyond the mill, and there the tailings are impounded and dewatered with safety and without contamination of the water in the creek which flows into the city.

The ore of the Spring Hill mine occurs as a relatively large body of low-grade ore on a contact between limestone and diorite. There were numerous quartz lode operations for gold in the Helena district in previous years,

but at the present time all activity is confined to a few small properties. The Montana Mines Corporation is the principal factor in the district, and its Spring Hill property was the leading producer of gold in Montana in 1930, with a total production of 13,149 ounces of gold during the year; the total production since operation began in 1928 and up to the present time has been 31,743 ounces of gold. Working an ore body of low grade, the scale of operation is on a basis of 225 to 250 tons of crude ore per day, and while it is not large, the operation is an efficient one in many respects and it presents problems which are of interest and which may be typical of many small scale mining operations.

LOCATED within a few miles of Helena, some of the problems of the operation are not difficult. Thus it is that an ample labor supply is available in Helena at nearly all times, and in the event of shortage there are additional

* Mill Superintendent and † Mine Superintendent Montana Mines Corporation, Helena, Mont.

sources in the adjacent mining districts. With the exception of the operating officials and a few others, the entire force resides in the city, and dormitory and boarding facilities are not necessary at the property. Transportation is likewise a minor problem, not only because of the short distance, but also because of economical motor transport over a fair road with easy grades and few sharp curves. Finally, the location is one relatively accessible to electric power, and a transmission line from the city to the mine provides commercial electric power of hydro-electric generation.

The climate of the region is a considerable factor influencing the operation, presenting extreme ranges of temperature, a limited and variable precipitation, and an uncertain natural water supply. Many phases of the operation are directly conditioned by the exigencies of the climate, while the other factors of significance are the character of the ore itself and the metallurgical problem of the recovery of values.

The ore is found in large, irregular masses at the contact of an intrusive body of diorite and Madison limestone. The ore is composed of the usual contact metamorphic minerals, such as diopside, amphiboles, actinolite, and some quartz, and the combination is finely crystalline. It is extremely hard and tough, and temperature adjustments and jointing have cracked and seamed the ore in all directions. The blasting of the hard ore, seamed and cracked as it is, produces large, coarse rock which necessitates the heavy reinforcing of all haulage equipment and the provision of extra-capacity crushing facilities as described below. A compensating advantage of the hard rock is that it stands in the mine in openings up to 70 ft. in width without timber support, and little or no timber is used for this purpose in the mine.

THE metallurgical problem consists of crushing and grinding the ore to the required fineness and the recovery of as much of the gold as possible within the economic limits of cost. Crushing and grinding are effected by the use of large and over-capacity equipment, and although the equipment is not utilized to capacity at present, it is available when needed, and it makes for saving in the breaking required in the mine, as well as in the fine comminution necessary in the mill. Gold is the only paying mineral recovered, and with the gold intimately associated with the iron sulphides in minute particles, the product is essentially a gold-bearing iron concentrate from the flotation cells. The extraction varies several percent, and it is dependent upon the degree of fineness of the grinding and the varying sulphide

*A bird's-eye view
of the Spring Hill
plant*



content of the ore. A small proportion of free gold in the ore complicates the problem still further, but as indicated above, the limitations of cost on a low-grade ore determine the recovery which is practicable.

The ore cars in use in the mine are of the side-dump pattern, with a capacity of 35 cu. ft., or 1½ to 2 tons of the broken ore or waste. Nine of the cars in use were purchased and later heavily reinforced in our own shop; and as the tonnage requirements increased, six additional cars were constructed in our shop, with the reinforcing incorporated in the design of the cars. The reinforcing embodied in all of the cars consists essentially of angle iron instead of strap iron at the tops of the doors, heavy iron plates riveted to the car bodies above the dump castings, and oversize dump castings and axle housing castings. In addition,

the cars built in our shop were built of heavier plates and straps.

There are approximately 500 ft. of mine track from the portal of the haulage tunnel to the coarse ore bin of the crushing plant, and this section of track is covered with a snow shed for protection from snow and ice in winter. The snow shed is of skeleton frame construction 8 ft. high and 8 ft. wide, covered with corrugated iron. At the portal of the tunnel, the shed is widened to a structure 40 ft. wide and 70 ft. long of the same kind of construction for use as a timber shed for the mine. A 30-in. swing cut-off saw is installed in the timber shed for framing timber as required. The fire hazard in this type of construction is small, but inasmuch as the timber shed is directly connected with the tunnel portal, it is constructed so that several sections of the corrugated iron next to



the portal may be knocked out readily in order to provide a cross draft in the event of fire. As stated, there is little timber used in the mine for purposes of support, but a fire door is provided in the tunnel at a distance of 150 ft. from the portal. The fire door in the tunnel and a counterbalanced vertical sliding door at the tunnel portal are used for controlling mine ventilation in cold weather by retarding the strong natural draft.

THE miners' change house is located on the creek flat near the timber shed, and it is connected with that structure by means of a small bridge over the creek and a stairway up the slope to the carbide house just outside the shed. The change house is 32 ft. long and 20 ft. wide; it is of frame construction, covered with roofing paper on the outside

and inside it has a floor of concrete, with the inside walls and ceiling lined with insulite board for additional warmth and fire resistance. There are windows on three sides of the building, and benches for the men are fastened to the walls along both sides and one end of the building on the inside, with a standing desk for use in making out time cards and reports built in against the wall at the opposite end. Clothes space is provided on short boards fitted with hooks on each side, and the boards are raised and lowered from the ceiling by means of ropes and pulleys, the ropes being fastened to the top rail of the benches. Two men use one board together, and there are sufficient boards for 70 men. Heat is provided by a large sheet-iron stove in the middle of the building, and the stove is capable of burning broken timber from the mine. Shower baths are not

provided because of the proximity to the city and the absence of housing facilities at the mine. The carbide house is a small building at the upper end of the stairs from the change house, and it is used for storing carbide and a few supplies; a receptacle for screening used carbide is placed below a small chute cut in the outside wall of the house.

A warehouse of skeleton frame construction covered with galvanized corrugated iron is situated on the creek flat in a convenient location between the change house and the crushing plant. The building is 56 ft. long and 26 ft. wide, with windows on one side and one end, and it has large double doors at the other end and a small door on one side. Supplies and equipment not in use are stored in the building, and it is equipped with shelves and bins for storing spare machine parts, pipe fittings, electrical

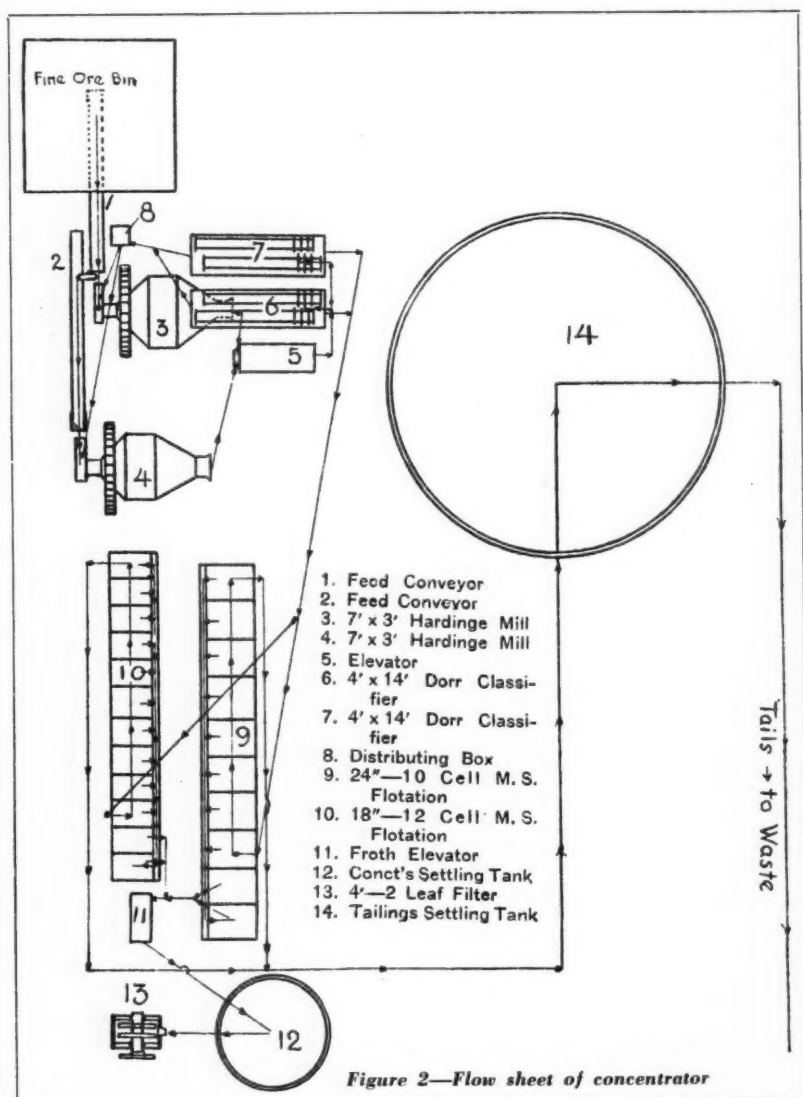


Figure 2—Flow sheet of concentrator

supplies, and miscellaneous items. A plank floor covers the end of the building where these supplies are kept, and a rough table is provided on the floor for use in unpacking and checking supplies. The large end doors give direct access to the interior of the building with a truck.

A five-stall garage with two long stalls and three short stalls accommodates two trucks and three passenger cars. This building is likewise of frame construction, covered with galvanized corrugated iron. It is 44 ft. in length and 19 feet in width for the truck stalls and 16 ft. in width for the other stalls. The sides of the building are of skeleton construction, while the roof is covered with shiplap and tar paper under the galvanized iron. Two 440-volt electric space heaters in the motor end of each stall and placed on iron stands a few inches above the ground provide all the

heat necessary to prevent the cars from freezing in severe cold weather.

The blacksmith shop is located approximately 50 ft. from the side of the timber shed, and it has mine track connections with the haulage track and with the track over a waste fill to the highway which is used for bringing in supplies. The shop is 46 ft. in length and 26 ft. in width, of frame construction covered with tar paper and corrugated galvanized iron on the sides and roof, and it is equipped with a ventilating cupola and hoods and stacks with roof jacks for the forges. The building was rebuilt recently to replace a similar but smaller structure destroyed by fire. A feature of the new building is that the oil pressure tank for the oil-fired drill steel furnace is located at some distance from the building at an elevation on the slope for gravity feed, and there are

both outside and inside valves on the oil line for shutting off the flow. The shop has a spur track running the length of the building for bringing in the drill steel and supplies and for handling mine cars to be repaired. Equipment of the blacksmith shop includes two drill steel sharpening machines, with an oil-fired drill steel forge between them and a combination drill steel tempering tank and table in front; a piston drilling machine converted into a power triphammer; a blacksmith forge and anvils. In addition, there are several power-driven machines, including a drill press, hack saw, grindstone, and emery wheels; and there are the necessary tools and benches for drill machine repairs, pipe fitting, and general repair work. Compressed air for the sharpening machines, forges, and tempering tank is brought in through a 2-in. overhead line from the main air line to the mine. The shafting for driving the power machines is driven by one 5-horsepower motor set overhead on a plane with the shafting.

The mine and assay offices were formerly small separate buildings on the mine slope of the gulch, and they have now been combined as one building in a location between the mine and mill and next to the highway through the property. The combined office is of frame construction, covered with roofing paper. The assay office section consists of the assay laboratory, a small room for the assay scales, and an addition for sample crushing, the first two of which are lined with gypsum board for fire resistance. The laboratory is equipped with an oil-fired assay furnace, the pressure tank for which is located outside at an elevation a short distance from the building. The mine office section is used only for preparing reports and for mapping, and it has little equipment other than a drafting table and chairs. A glass-covered bulletin board for general notices is attached to the outside wall of the mine office. Safety-first bulletin boards for safety posters are located at the mine portal and in the crushing plant and the mill proper.

A small frame structure was moved to a new location between the change house and the warehouse and there rebuilt for use as an electric shop and a diamond setting shop. Heat is provided by electric space heaters mounted on an iron stand; and the necessary benches, shelves, and racks were installed. Ordinary electrical repairs are made right in the building.

THE original crushing plant consisted of a 50-ton coarse ore bin, one 14 x 18-in. jaw crusher, and one 3-ft. Symons fine cone crusher. This plant was not adequate for the hard rock and the constantly increasing tonnage re-

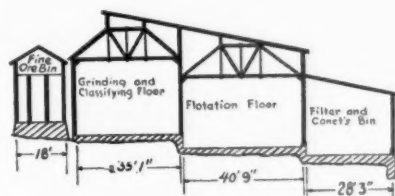


Figure 3—Side elevation of mill building

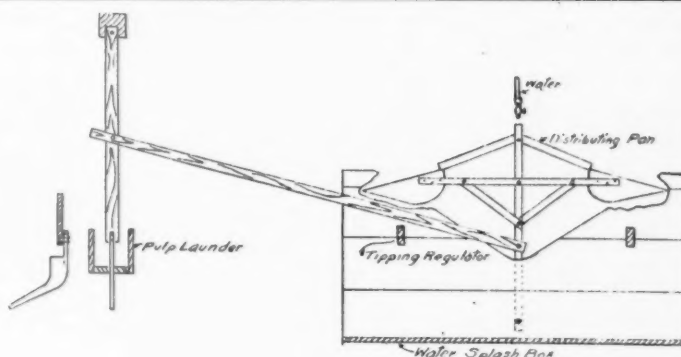


Figure 5—Samplers

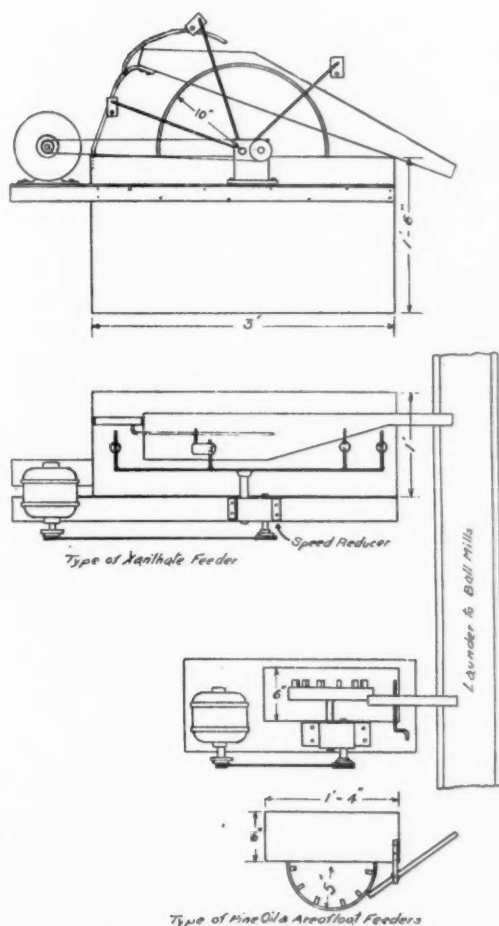


Figure 4—Flotation reagent feeders

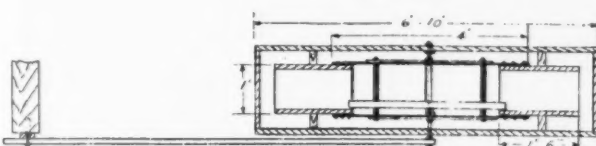


Figure 6—Tailings dam

quirements. In the autumn of 1929 the crushing plant was remodeled and a new unit added. A new 24 x 36-in. jaw crusher was installed, the capacity of which was much greater than the tonnage requirements warranted, but it had been determined that a large crusher would greatly reduce costly secondary breaking of ore in the mine stopes. A 200-ton coarse ore bin was constructed; also a new crusher building for housing

the large jaw crusher, and the 14 x 18-in. jaw crusher, now used as a secondary breaker.

The flow sheet of the remodeled crushing plant is as follows: The 24 x 36-in. crusher takes the ore as it is delivered to the ore bin from the mine, the ore being fed through chute gates. The grizzly usually installed between the ore bin and crusher was omitted, partly to restrict

crusher discharge and partly to permit large slabs to be fed to the crusher more readily. The crusher is set at 5 in. and delivers the crushed product at a normal rate of 35 tons an hour directly on an 18-in. cross conveyor belt. This conveyor belt carries the ore for 55 ft., after which it is dumped on a self-cleaning bar grizzly; the belt itself receives severe service due both to the size of the product and the sharp edges of it, and conse-

quently a conveyor belt of maximum strength and quality is used. The oversize product of the grizzly falls into the opening of the 14 x 18-in. jaw crusher set at 1½ ins. The crushed product is delivered to an 18-in. cross conveyor belt which also receives the undersize from the grizzly. This conveyor belt carries the ore for 105 ft. and dumps it on a 4-ft. by 5-ft. Leahy No-Blind vibrating screen.

The oversize from the vibrating screen falls directly into the opening of the 3-ft. Symons fine cone crusher, set at ½-in. at the discharge opening. The cone crusher delivers the crushed product directly to a 16-in. belt conveyor which also receives the undersize from the vibrating screen. This conveyor is 780 ft. in length, in one section 350 ft. long at a 10-degree angle, and in another section 430 ft. long at a 21-degree vertical angle. Conveyor belting of ordinary quality is used on this conveyor, and after having carried approximately 175,000 tons of crushed ore in the three years of operation, the belt appears to be good for service at least two years more. The crushed ore is delivered directly into the concentrator storage bin from the conveyor, the bin being of 200 tons capacity.

As a result of remodeling and enlarging the crushing plant, the normal crushing rate has been increased to 35 tons per hour from the previous rate of 10 to 12 tons per hour, and at the same time the mechanical difficulties have been greatly reduced. A reduction of 50 to 75 cents per ton in mining costs was likewise effected by the elimination of much secondary breaking in the mine.

THE concentrator began operation as a cyanide plant early in 1928 and operated as such until March, 1929. The ore did not respond to cyanide treatment, due to the fouling of the solutions by the arsenic and antimony contained in the ore, with a resultant loss of gold. The concentrator was converted into a straight flotation treatment plant during a brief shutdown, and since May, 1929, the Spring Hill ore has been concentrated by bulk flotation. The flow sheet of the concentrator is relatively simple, consisting of grinding and classifying, flotation, and settling to reclaim water.

The original grinding equipment consisted of two 7-ft. by 36-in. Hardinge conical ball mills grinding in parallel and charged with 4-in. cast iron balls, and two 4-ft. x 14-ft. Dorr duplex classifiers in closed circuit with either one or both ball mills. This grinding unit had a capacity of 200 tons per 24 hours, the classifiers delivering a product ground to 3 percent plus 80 mesh and 60 percent minus 200 mesh. In August, 1930, an 8-ft. x 48-in. Hardinge conical ball mill was added to the grinding cir-

cuit. This mill is in closed circuit with a 6-ft. x 20-ft. Dorr duplex classifier. At present the total capacity of the grinding circuit is about 350 tons per 24 hours, but the utilized capacity of 250 tons per day delivers a product ground to 2.5 percent plus 100 mesh and 83 percent to minus 200 mesh. The overflow from the Dorr classifiers goes directly to the flotation cells.

The flotation circuit consists of one 12-cell 18-in. flotation machine and one 10-cell 24-in. flotation machine, both of which are the Minerals Separation Sub A type. The machines work in parallel and each makes a concentrate and final tailing. The concentrates are elevated to a 4-ft. 2-disc American filter and are dried to a moisture content of 10 percent. The filtered concentrate falls into a storage bin from which it is loaded into trucks below for hauling to the railroad at Helena and shipment to the lead smelter of the American Smelting & Refining Company at East Helena.

AT THE present time, the mill tailings flow by gravity to one of two tailings ponds. These ponds are maintained by keeping a log and sand face a little above the general level of the ponds. Clear water is decanted from the ponds, and if additional water is needed for the concentrator, it is pumped back up to the mill water storage tank—otherwise, the clear water goes to waste.

The sources of water for the concentrator are the small stream in the gulch, a spring from which the mine derives its name, a large drill hole to bedrock in the stream bed, the water pumped from the mine workings, and the water reclaimed from tailings. In the summer and fall the stream dries up, but the spring and drill hole maintain a steady flow, and an increasing supply is available from the mine. All of the fresh water to be used either flows or is pumped to a central pumping station, from which it is distributed to the crushing plant and to the concentrator water storage tank. During the low-water period, approximately 40 percent of the water used in the concentrator is reclaimed from the tailings.

Fire protection for the concentrator and the principal buildings of the surface plant consists of chemical fire extinguishers in the various buildings and water under pressure from the mill water storage tank and a 50-ft. x 10-ft. settling tank through standard 2-in. fire hose connections. The 2-in. fire protection water line from the concentrator to the surface plant is installed inside the long conveyor structure. The line is kept empty for protection from freezing except when in use, and it is connected with the mill water supply through

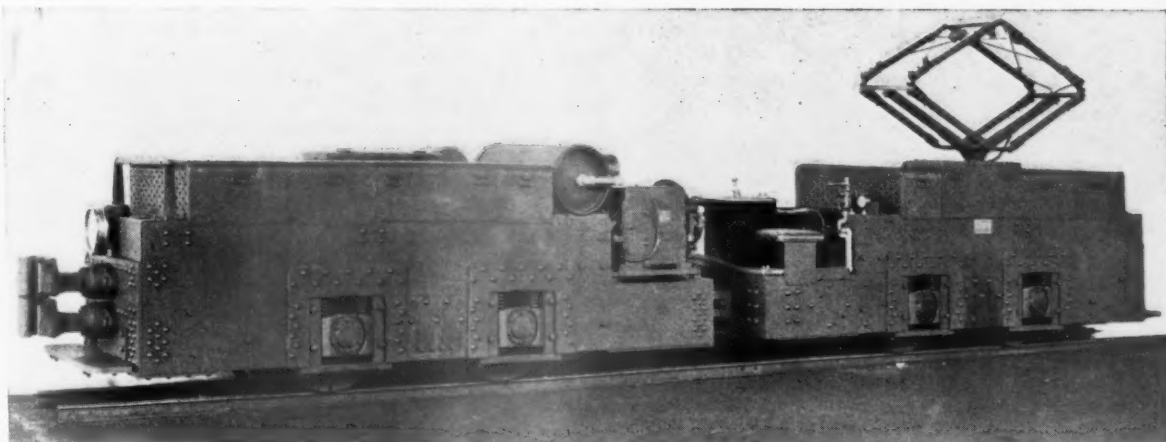
double valves to prevent leakage. Standard outlets and hose connections are provided at several points in the line for the protection of the mine and assay office, warehouse, garage, change house, electric shop, and pumping station, and for the compressor house and crushing plant. The system does not meet the underwriters' requirements for fire protection, but it is inexpensive and accessible and safeguarded against freezing because empty except when it is to be used.

THE Montana Power Company supplies the electric power used in the concentrator, crushing plant, and compressor house. The power is received at a central transformer house at 11,000 volts, and there it is reduced to 2,200 and 440 volts. Practically all of the motors are either 2,200-volt or 440-volt motors, 3-phase, 60-cycle. A few small motors and the lighting circuit are 110 volts.

There are two air compressors in use at the property, one a Sullivan angle compound compressor of 850 cu. ft. capacity at the elevation of the mine, and the other an Ingersoll-Rand E. R. I. compressor of 350 cu. ft. capacity. These air compressors were formerly cooled by pumping water from a well with small centrifugal pumps belted to the compressors. After passing through the compressors the water ran to waste, but the water at certain seasons was low, and the man in charge of the compressors on each shift had other duties outside of the compressor house. The cooling is now effected by the use of water from an 8-ft. diameter by 8-ft. high tank mounted outside and above the compressor building, the water from the tank being circulated by air lifts. This cooling system has not failed in two years of use, and it has worked equally well in summer and winter. The only additional water required is that to make up the loss from evaporation.

The air compressors discharge into a small receiver just outside of the compressor house, and from this receiver the air is piped 350 ft. in a 5-in. line to a large receiver situated inside of the timber shed at the mine portal. The air line takes as direct a route as possible, and it has an up grade all the way between the two receivers. The large receiver is set vertically, with the intake near the middle of the tank, but most of the water in the compressed air is extracted from the small receiver, and any remaining water from the large receiver.

AS MENTIONED at the outset, transportation is not a serious or difficult problem because of the short distance from Helena and the availability of a fair (Continued on page 398)



Hauling Morenci's Muck

BY

M. C. Pellish*

THE underground haulage system at the Morenci branch of the Phelps Dodge Corporation is unique in that it combines the utilization of 10-ton capacity cars on 20-in. track gauge. The adoption of the small gauge is explained by the fact that when the district was founded Capt. Nicholas S. Davis, who was engineer of construction as well as mine engineer of the Longfellow mine, had chosen this gauge because of previous experience in mines of California. It was first established for surface operation and was necessarily duplicated for underground work later to maintain a unified system.

As the mine developed in magnitude and a much greater production was forthcoming the question of gauge was again carefully considered, i. e., whether to continue the then existing 20-in. gauge or to adopt a 36-in. gauge. It was finally decided to develop the gauge then in use and to endeavor to maintain, as nearly as possible, the estimated costs based on a 36-in. system with heavier equipment. This decision was reached due to the enormous cost of changing the elaborate system, as well as the difficulty of supporting ground in the enlarged openings such as the larger gauge would demand.

The cars were developed from a 3½-

ton to 4½- 5½- and finally to a 10-ton capacity. The rarity of such a system is again emphasized by the fact that the ore train pulled is probably the heaviest ever operated in underground mine service over narrow-gauge tracks—a 300-ton train on a 20-in. gauge track—at working costs closely approximating those obtained on systems involving a much greater capital expenditure.

INTRODUCTION OF ELECTRIC LOCOMOTIVES

ELECTRIC locomotives were first introduced in 1905, replacing mules, which were then in use. The locomotives were used on the surface as well as on the important levels of the Humboldt mine. They were single 6-ton units equipped with cast-iron frames, chilled cast-iron driving wheels, hand-operated brakes and two 250-volt, 15-hp. series wound motors. The rated draw bar pull was 1,500 pounds, with a speed of 8 miles per hour. These first locomotives, though more than 25 years old, are still giving satisfactory service on the surface.

When the problem of greater production was encountered, it was accompanied by the question of acquiring locomotives sufficiently large to haul a 300-ton train. This was accomplished by using three locomotives in tandem, but was later reduced to two locomotives in tandem. The later locomotives, of course, are equipped

with driving motors increased in size from 15 to 30 hp., and the chilled cast-iron wheels have been replaced by the steel wheels. The latest locomotives are also equipped with contactor control, roller-bearing journals, air brakes and other evolutionary refinements. Changes are now being contemplated whereby the present permanent tandem locomotives may be converted into semi-separable tandem units, so that the tandems may be quickly separated temporarily to permit raising and lowering in the shaft of the single units, when it becomes necessary to move the locomotives from one level to another.

The accompanying tabulation lists principal data on the latest haulage equipment:

Type of locomotive—Jeffrey permanent tandem haulage.
Weight of locomotive—12 tons.
Number of motors—4.
Class number of motors—MH-117.
Rating of each motor—30 hp.
Rated D. B. P.—6,000.
Speed at rated D. B. P.—6.3.
Control—Progressive series-parallel semi-magnetic contactor.
Wheels—Steel tired inside the frame.
Type journals—Timken roller bearing.
Type brakes—Manual and automatic air.
Type of coupler—M. C. B. type, SP. mounted.
Track gauge—20 in.
Overall width—46½ in.
Length over frame, without bumpers—each unit—11 ft. 7 in.
Overall length (each unit)—13 ft. 9 in.
Overall length (both units)—27 ft. 6¼ in.
Height overall (excluding trolley)—51 in.
Wheel base—42 in.
Diameter of wheels—26 in.

The photograph (at head of article) is

* Jeffrey Manufacturing Company.

illustrative of the locomotive referred to in the foregoing.

TRAILING EQUIPMENT

IN addition to the 10-ton cars there are several 6-ton cars in use. The following table gives data on the two sizes of cars used:

	6-ton	10-ton
Capacity	120 cu. ft.	200 cu. ft.
Wheels C. I. diameter.	24 in.	24 in.
Length inside	8 ft.	11 ft. 6 in.
Width	5 ft. 6 in.	5 ft. 10 in.
Overall length	11 ft. 4 in.	14 ft. 6 in.
Height above rail.	5 ft. 3 in.	5 ft. 8½ in.
Coupler height	25 in.	17 in.
Wheel base	48 in.	60 in.
Underframe channels.	7 in.	8 in.
Thickness of body plates	¼ in.	¾ in.
Journals	3½ x 7½ in.	4½ x 7½ in.
Weight empty	7,000 lbs.	9,700 lbs.

Cars are of one general type, gable bottomed, side dumping, and of all steel construction. The journals are of the M. C. B. type, outside the wheels, with suitable double-coil springs over the journal boxes. The doors of the cars are of full length, are swung by three or four hinges and held by the same number of catches or dogs on a through horizontal square rod. They are operated by a hand lever at one end of the car, fastened by a slip link. Draft gear is of the standard design double coil spring type. Couplers on the smaller cars are of malleable cast iron, designed to take links and pins, while those on the larger cars are the standard M. C. B. ¾ size automatic type. As shown in the above table the difference of 8 in. in the coupler heights between the two cars calls for a special connecting bar. Similarly the locomotives are provided with a special double-mouthed drawhead or with two single drawheads, and when latterly equipped one is placed immediately above the other. One-half of the cars of each train is equipped with air brakes, and these are alternately spaced so that an even distribution of braking effort is effected throughout the entire train.

COLLECTOR SYSTEM

A DOUBLE-O figure 8 trolley wire is held with straight line suspension type hangers. The feeder line is a 500,000 circular mill insulated cable and it is tapped at the critical or peak load points. A circuit breaker is installed in the surface substation; it is set to kick out the entire underground circuit at 1,500 amperes. The locomotives are all equipped with pantograph type trolleys.

The old rails were 25-lb., but these are gradually being replaced with 60-lb. steel, which is the standard size adopted and installed in all the newer workings. The rails are bonded with 4/0 compressed terminal bonds of flexible wire, the bonds being exposed to facilitate inspection. The holes for the terminals are placed outside the splice plates, 29 in. apart, and the bond itself measures 32 in. in

length. Bonds of this type can be installed by unskilled labor. All tracks are crossbonded between the two rails in addition to the regular rail bonding. Four return conductors of 4/0 bare copper wire go to the negative bus on the d. c. switchboard.

The tracks are laid with 6 x 8-in. ties 4 ft. long spaced on 30-in. centers and spikes 5 in. long are used. The grades in the old parts of the mine vary slightly, but as a rule do not exceed 0.5 percent. In all the newer workings the grade is maintained at 0.4 percent with the load. The radius of the curves in the old workings vary from 60 to 80 ft., while those of the newer are from 100 to 120 ft. Stiff bolted frogs with cast-iron spacing blocks are used, and in some instances frogs with manganese steel inserts have been installed. The insert is a one-piece casting designed to give a full-tread bearing over the area of maximum wear. Both on the surface and under ground, split switches are used generally, but around loaded chutes and other places which are hard to keep clean stub switches are used. An inexpensive form of switch stand is commonly used; it is of the ground throw type, provided with either plain or weighted lever. The weights are provided with a handle to facilitate the throwing. Stands with the throw parallel to the track are here considered to be more satisfactory than the throw perpendicular to the track, since there is less liability to accident in operating them.

SWITCH AND BLOCK SIGNALS

SIGNAL lights are provided to show the position of the switch on all underground track switches. Green lights indicate a clear main trunk line, while the red tells the operators that the switch is set for some branch or siding off the main line. The signaling is accomplished by means of a double-throw electric switch controlled by the track-switch operating mechanism, actuating the negative side of the wires from the colored lamps which are connected to the trolley circuit.

The block signal installation consists of a separate signal wire of No. 2 hard drawn copper, paralleling and 3 in. away from the trolley wire. The 20-in. copper roller on the pantograph bridges these two wires when the locomotive is in the block, thus impressing the trolley voltage on the signal wire and lighting 25-watt mill type lamps in semaphore lanterns at both ends of the block as well as on the curves. The lamps are placed on the same side as the switch lights and also the same side of the tunnel. The lenses used on the lantern are of red and yellow, the bulbs are connected to the ground, and there are two

globes in parallel to each lantern; this insures a signal when one of the lamps burns out. The signals on the curves can be seen from either direction, and they are also used to warn men working in the tunnel of approaching trains. A lamp on the side track indicates the condition of the block on the straight track, while a lamp on the straight track near the entrance of the side drift shows the condition of the block in the side drift.

The foregoing described signal system does not give absolute protection, since it does not operate when detached cars or trucks are left standing or moving within the block. In the 12 or 15 years of operating this system there has been no serious trouble resulting from these causes. A distinct advantage of this type of block system is that of its low cost of installation and upkeep. The service of an expert electrician is not necessary to maintain its operation, but the attention of merely a helper is all that is required.

LOCOMOTIVE DUTIES

ON the fifth level 50-lb. rail is laid, the curves are 60 to 80 ft. radius, the grades vary from 0.1 to 0.9 percent with the load, and under the present conditions the trains are made up of 15 to 24 cars of the 10-ton capacity, of 20 to 30 cars of the 6-ton capacity. There are three 10-ton car trains and one 6-ton car train in operation. The locomotives make seven trips each shift with the former and five with the latter. The average distance of each haul is approximately 4,000 ft.

Loading conditions—The train enters the loading area and it is then split in two sections. A snap motor, which is similar to the haulage motor, couples onto the cut-off section of the incoming train and loading then proceeds. The cars are pulled past the chute from which the material is to be drawn until the last compartment of the last car is directly beneath the chute. The brakeman up in the pony set then loads the car. Owing to the irregular flow of the muck it is necessary for the locomotive to stop and start the train two times for each car that is loaded, once for each compartment. When the loading operation is completed for both sections of the haulage train the loaded sections are assembled and the haulage motor starts for the dump. The snap motor, after the assembly of the sections, is released to again perform its duties as the next empty train enters the loading area.

The train after loading proceeds to the inspection station. Each stope has its own inspection station at distances of 500 to 1,500 ft. from the stope. As the train passes slowly through the inspection station a (Continued on page 398)

PRACTICAL OPERATING MEN'S DEPARTMENT COAL

Practical Operating Problems of the Coal Mining Industry

NEWELL G. ALFORD, Editor

Current trends in bituminous coal

By Newell G. Alford

IF A TRUE view offered some hope in the immediate future of coal, it would be heartening to many an operator. If only the coming six or nine months could be approached with some degree of certainty on market conditions—it would be a relief.

Passing the last and mildest winter in at least 20 of them, coal markets have shrunk and production has continued its decline while depression romped its raucous route. What is ahead beside uncertainty?

Time was, when fully armed with forecast data, one might have ensconced himself on the watchtower of the industry and elevated his sights to an imaginary point on an adventurous dotted line of coal production. Yes, even to a distance of some 10 years away.

But right now we are not interested so much with adventures into the realms of chance. The operator wants to know the immediate reality. If he knew the worst in store he could meet it with courage. So much for viewpoint.

In current trade journal opinions there is unanimous agreement about the general conditions in bituminous coal, much of which is familiar. An understanding is easier, however, with some knowledge of the trends in various sections of the country in the larger divisions of consumption.

The monthly consumption data by the statistics section of the U. S. Bureau of Mines is the only source of consecutive monthly use information, issue of which began with January, 1928, in the Weekly Coal Reports. These data for consumption by railroads, by-product coke plants and electric utilities are complete for monthly volume used from January, 1928, to May, 1931, both inclusive. For consumption by industrial plants, for gas coal used in steel and gas works and coal delivered to retail dealers, reports are made of 60-day consumption between lapses of a month wherein no figures are given. Complete consumption data for these latter groups can not be

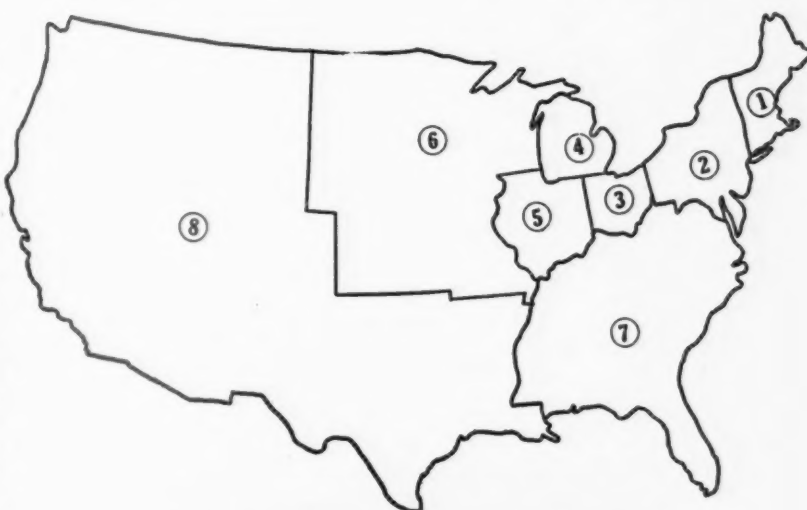


Figure 1—Bituminous Coal Consumption Trend Districts, based on regional divisions used by Statistics Section, Coal Division, United States Bureau of Mines, but rearranged for convenience here. Refers to consumption trends shown in Figures 3 to 11, inclusive

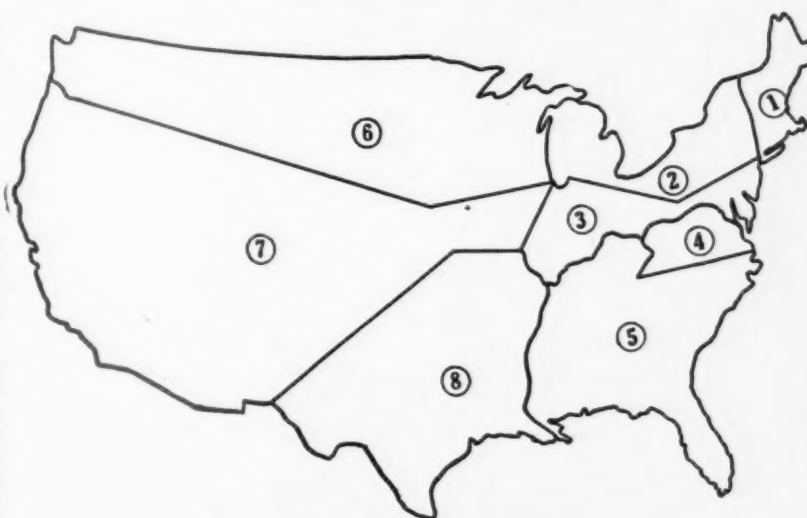
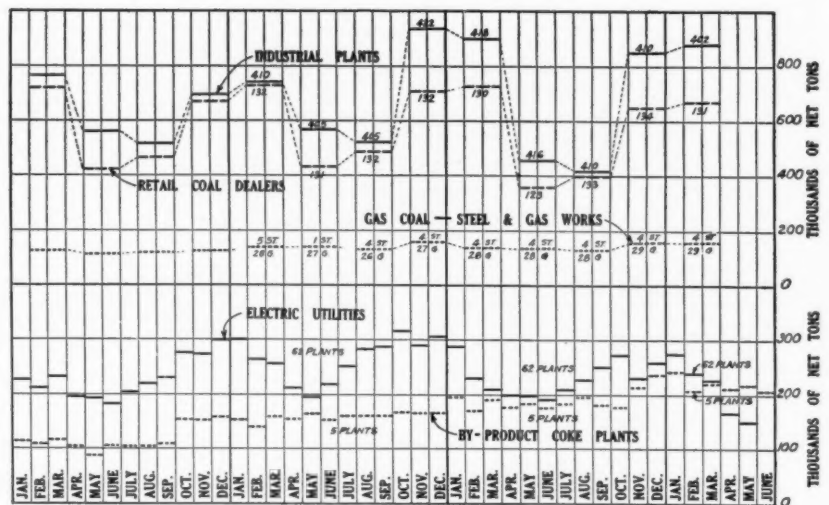


Figure 2—Bituminous Coal Consumption Districts for Class 1 Railroads; identical with grouping of the Coal Division, United States Bureau of Mines. District consumption shown in Figure 11

gathered by the Bureau of Mines until much larger funds are appropriated by Congress for this purpose.

In each of these latter groups a selected number of representative units in geographical sections are questioned for the periods covered. Each report by the coal division of the U. S. Bureau of Mines includes all the plants that happen to make returns for the period covered, but one survey may report on a different number of plants. In the New England states, 410 industrial plants reported for the 61 days of November-December, 1930, and 402 of the plants in this grouping are represented in the

Figure 3—Monthly Bituminous Coal Consumption Trends for New England States, District 1 in Figure 1. Actual volumes used in electric utilities and by-product coke plants

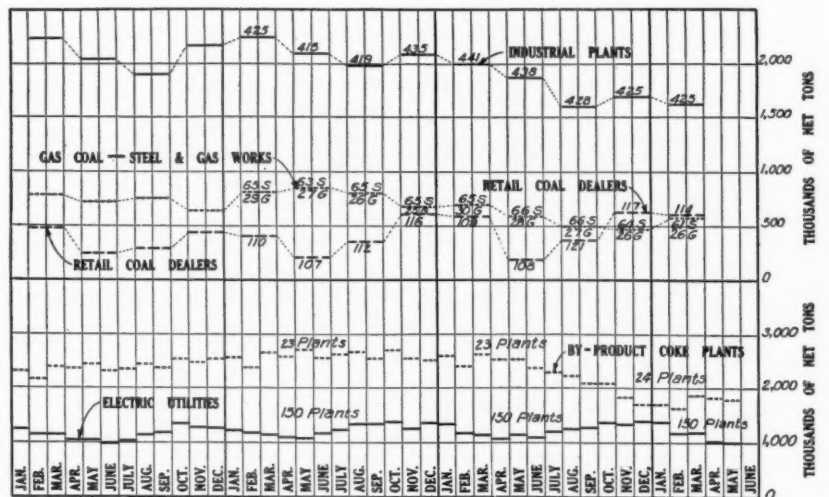


two-month period of February-March, 1931.

While any comparisons drawn from these data are based on the consumption of an identical group of plants, there are slight discrepancies due to small variations in the number of plants reporting on the trend of the volumes used in their respective lines. The three exceptions to this being railroads, by-product coke plants and electric utilities, where full consumption is reported.

With the exception of Class 1 railroads, these respective groups of consumption are dealt with for the geographical divisions shown on the map in Figure 1. This distribution combines the lake dock territory with the states of

Figure 4—Monthly Bituminous Coal Consumption Trends for New York and Pennsylvania in District 2 in Figure 1. Actual volumes used in electric utilities and by-product coke plants

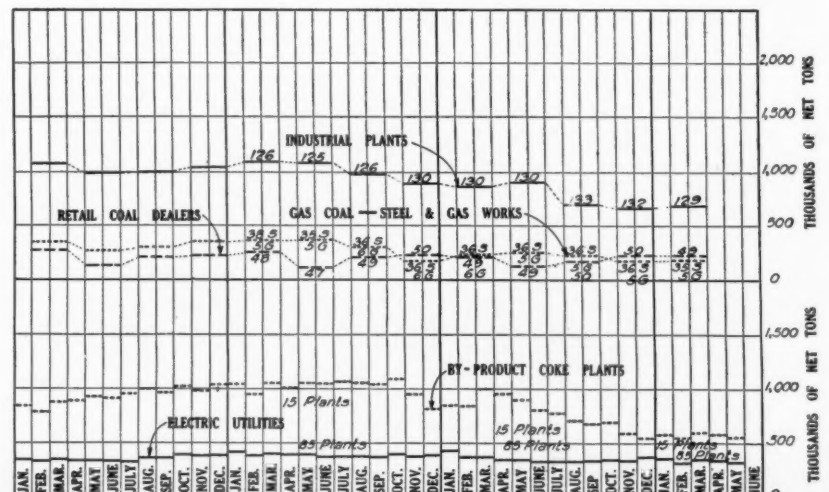


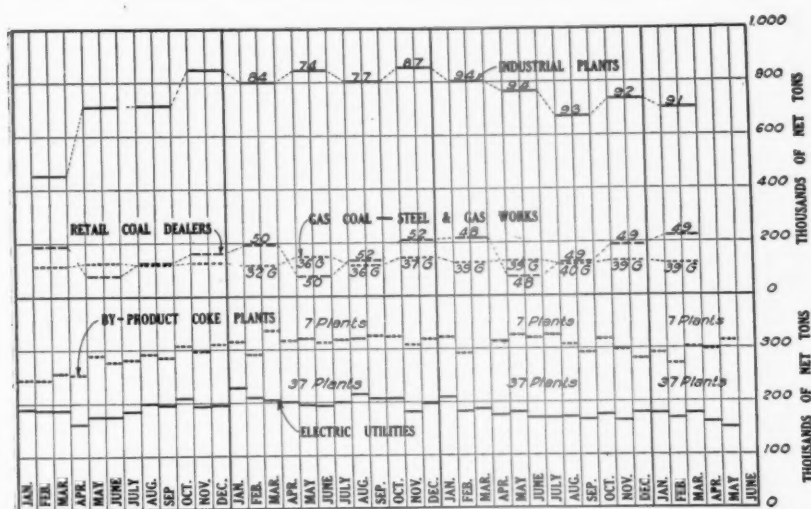
Nebraska, Iowa, Kansas, and Missouri. Although the surveys separate the lake dock area from these states for all consumption except by-product coke plants, a combination of the two regions is necessary to a study of the trends in reported consumption for this section of the United States.

The other use groups may be studied separately for the lake dock territory and the other four states.

The coal division's reports on Class 1 railroad consumption give complete monthly tonnage used in the districts shown on map in Figure 2. See that the only identical areas common to the maps in Figures 1 and 2 is the grouping of

Figure 5—Monthly Bituminous Coal Consumption Trends for Ohio in District 3 in Figure 1. Actual volumes used in electric utilities and by-product coke plants





the New England states in each case.

Figures 3 to 10, inclusive, for each of the geographical divisions given on map in Figure 1, show bituminous coal consumption trends (1928-May, 1931) in the selected group of units representing:

1. Industrial plants, excluding steel, coke and gas plants.
2. Retail coal dealers.
3. Gas coal used by steel and gas works.
4. Electric utilities (total consumption).
5. By-product coke plants (total consumption).

Figure 6—Monthly Bituminous Coal Consumption Trends for Southern Michigan, District 4 in Figure 1. Actual volumes used in electrical utilities and by-product coke plants

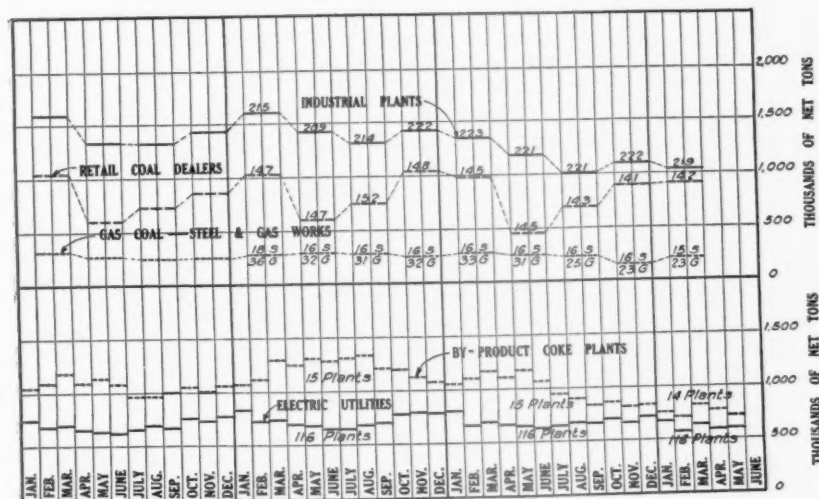


Figure 11 gives the total coals used by Class 1 railroads in each of 8 districts shown on map in Figure 2 from January, 1928, to and including May, 1931. With these are also the average weekly freight car loadings of anthracite, bituminous coal and coke and of total revenue freight of Class 1 roads in the same period.

Figure 12 gives the total national monthly trend of each consumption group in 1928 to and including May, 1931.

NEW ENGLAND STATES (Figure 3)

Industrial plants surveyed for the

Figure 7—Monthly Bituminous Coal Consumption Trends for Illinois and Indiana, District 5 in Figure 1. Actual volumes used in electrical utilities and by-product coke plants

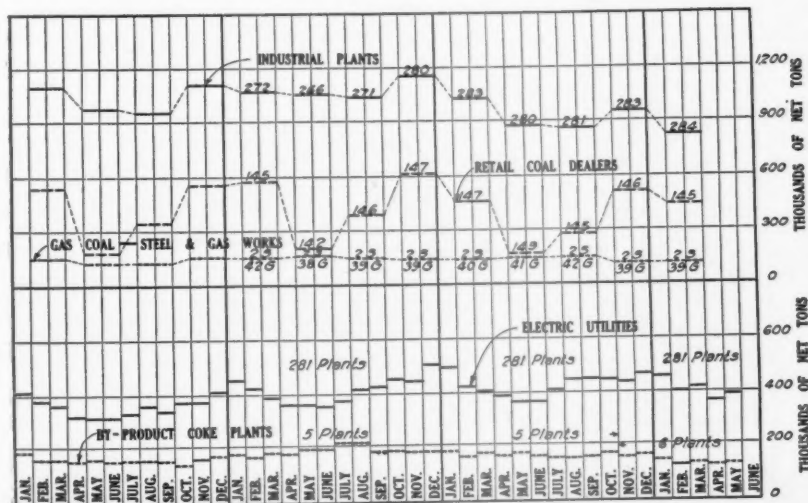


Figure 8—Monthly Bituminous Coal Consumption Trends for Lake Cargo Territory and the Lower Missouri Valley States, District 6 in Figure 1. Actual volumes used in electrical utilities and by-product coke plants

combined eight months in 1930 showed a 5.4 percent decline of tonnage used as against the picture for 1929, but the 1930 consumption was 7.4 percent greater in this group than in 1928. The last industrial plant period of February-March (1931) was larger than that in either 1928 or 1929, despite slightly fewer plants reporting in 1931. There was, however, an increasing seasonal variation for these plants, as well as for retail coal dealers deliveries.

In the latter instance, the retailers were relying on mines and transport for supplies. The surveyed annual bituminous deliveries to these selected retailers was about the same in 1930 as

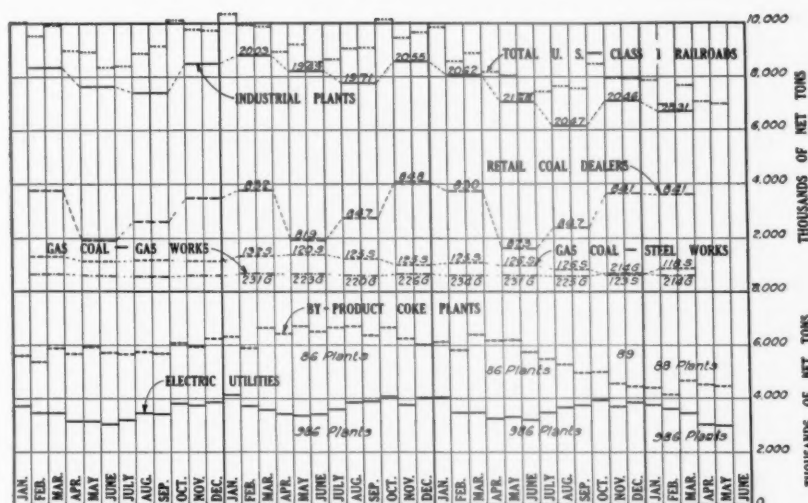


Figure 13.—Electric power produced and fuel used in Electric Utility Plants in New England States. From reports of Power Resources Division of the U. S. G. S.

	Total KWH made (Millions)	% KWH by Fuel	Coal (Net tons)	Oil used— (in equivalent coal) Net tons
1927.....	5470.5	63.6	2,709,503	245,225
1928.....	5058.8	60.1	2,748,237	163,107
1929.....	6608.8	60.4	3,144,180	476,676
1930.....	6390.7	66.5	2,754,295	508,670
1931*.....	2716.3	60.3	1,034,220	191,916
1930*.....	2708.4	60.4	1,109,759	178,456
1929*.....	2728.9	60.7	1,200,436	114,325

*First 5 months.

Figure 14.—Electric power produced and fuel used in Electric Utility Plants in Lake Dock and Lower Missouri Valley States, shown in Figure 1 as Group 6. From reports of Power Resources Division of the U. S. G. S.

	Total KWH made (Millions)	% KWH by Fuel	Coal (Net tons)	Oil used (in equivalent coal, net tons)	Natural gas used (in equivalent coal, net tons)
1927.....	6777.7	61.5	4,300,340	265,366	378,180
1928.....	7232.1	61.1	4,294,673	273,909	384,166
1929.....	8951.0	60.2	5,006,134	275,433	510,570
1930.....	8140.7	72.1	5,146,501	243,898	559,351
1931*.....	3202.8	74.4	2,001,894	92,266	226,625
1930*.....	3375.2	68.6	2,106,396	104,310	216,927
1929*.....	3216.3	64.6	1,994,700	134,541	173,011

*First 5 months.

Railroads was 9.3 percent lower in 1931 than in 1930, despite the handling of raw material and distribution of products. No record of motor-trucking activity is available, but the progressive saving in railroad fuel from more efficient use in New England, in the same 60-day periods, would mean not over 3 percent less in 1931 than 1930 if manufacturing in the same periods had been exactly equal; whereas, manufacturing here was 3.3 percent greater last April and May.

This group of states is unique in having no electric utility plants using natural gas and those in Vermont using water power exclusively. In Figure 3, the monthly variations reflect the

heavier demand at coal burning plants in 1929, 12.4 percent greater in volume for the year than in 1930, despite less rainfall in the latter year. (See Figure 13). But in 1930, with cheaper tide-water oil, use of oil in these plants increased 6.7 percent over the oil consumption in 1929. In 1929, for the same grouping, consumption of oil leaped 194 percent above the volume used in 1928, and 133 percent above the yearly average oil used for 1927-1928. In Figure 13, notice the constant increased use of oil through the first 5 months each of 1929, 1930 and 1931. For this year, with cheaper coal, the first five months in oil was 7.5 percent greater than the same

time in 1930. Oil became cheaper also.

At 96 cents per barrel last May, sea-board fuel oil made a record low price up until that time, with the average for the first 5 months of this year 5 cents per barrel below the same period in 1930, and 6 cents lower than the full 1930 average, based on data by the Standard Statistics Company.

As this July closed, one-year contracts on fuel oil in New England were quoted with a protected maximum of 85 cents per barrel with spot prices applying

Figure 12.—Total Monthly Bituminous Coal Use Trends, combining tonnage for all United States use classification districts, with total monthly bituminous coal used by Class 1 railroads; all as reported to the various United States Government agencies

where they are made under this figure. In July's last week New England's spot price was 75 cents per barrel, including 60 cents for freighting.

The records of bituminous coal used in by-product coke are complete and show gradual seasonal increases in Figure 3, largely due to growing use of coke for domestic purposes. New England coke plant use through 3 years and 6 months was:

	Net tons
1928.....	1,453,428
1929.....	1,919,858
1930.....	2,277,960
6 mos. 1931.....	1,301,298

This year's 6-month Yankee coke-plant coal consumption was 19.2 percent ahead of the same time in 1930. Both 1930 and 1929 ran respectively 14.8 percent and 32 percent ahead of their previous years in coal carbonized. Approximately 80 percent of this tonnage is now captive coal.

Combined bituminous all-rail and tide deliveries to New England were 10.4 percent less for the first 5 months of 1931 than for the same time in 1930, with the rail and tide respectively 4.6 percent and 13.0 percent behind their 1930 showing. These months of 1931 were practically equal to those of 1928 in both rail and tide receipts, but about 28 percent and 21 percent, respectively, below these months in 1927, when the first 5 months showed 3.6 million net tons all-rail and 6.9 million by tide, and a total for the year by land and water of 22 million net tons. In millions of net tons, the first 5 months and total for these years show receipts of:

	All-Rail	Tide	Total	Annual Total
1927.....	3.6	6.9	10.5	22.0
1928.....	2.7	5.5	8.2	19.9
1929.....	2.8	5.9	8.7	21.2
1930.....	2.7	6.2	8.9	19.9
1931.....	2.6	5.5	8.1	....

No accurate data are available about the present condition of stock piles in New England, but there is no evidence thus far of buying for storage.

LAKE DOCK STATES AND LOWER MISSOURI BASIN

(Figure 8)

While upper Wisconsin, Minnesota and the Dakotas are rightly considered a separate consumption area with dock relations, Government sources have arbitrarily grouped these states, for coal carbonized at by-product coke plants, with the Lower Missouri Valley states, see Figures 1 and 8. Neither is railroad consumption grouped for the lake dock states, and while there are obvious reasons for both variations, they may be eventually remedied.

Aside from the coke plants curve in Figure 8, the reported trend volumes (not complete tonnage consumed except for electric utility plants) on which this chart is based, are divided between the two districts thus:

	Lower Missouri Valley Percent	Lake Dock Territory Percent
Gas coal in steel and gas works.....	23.5	76.5
Industrial plants...	45.5	54.5
Retail coal deliveries	58.3	41.7
Electric utilities*	61.4	38.6

*Complete bituminous consumption 1928 to and including May, 1931.

Freight rate barriers reserve the Dakotas, Nebraska, and Kansas steam markets for local and western coals, which, with coals from Arkansas and Oklahoma, contend for the steam territory in western Iowa and in Missouri. This is mentioned only because a breakdown in trend data would be interesting to each of the operating districts involved if space permitted, especially because of rapidly growing consumption in natural gas.

A study of the energy forms used in electric utility plants in Group 6, Figure 7, well represents what substitute fuels have done to coal since 1928. Until 1929 natural gas had been used in these plants only in Kansas, wherein gas equivalent to about 384,000 tons of coal was burned in 1928.

Missouri began to use natural gas in electric utility plants in 1929, and was joined in 1930 by Nebraska. The importance of these gas increases is shown in Figure 14. This use of gas increased 32 percent in 1929 in this group, and again 9.6 percent in 1930 over 1929. The first 5 months of 1931 compared 4.4 percent higher than the same period of 1930.

Here use of fuel oil for electric utility plants declined 12.7 percent through 1928 and 1930, and any decline in fuel oil is notable. Through the same term

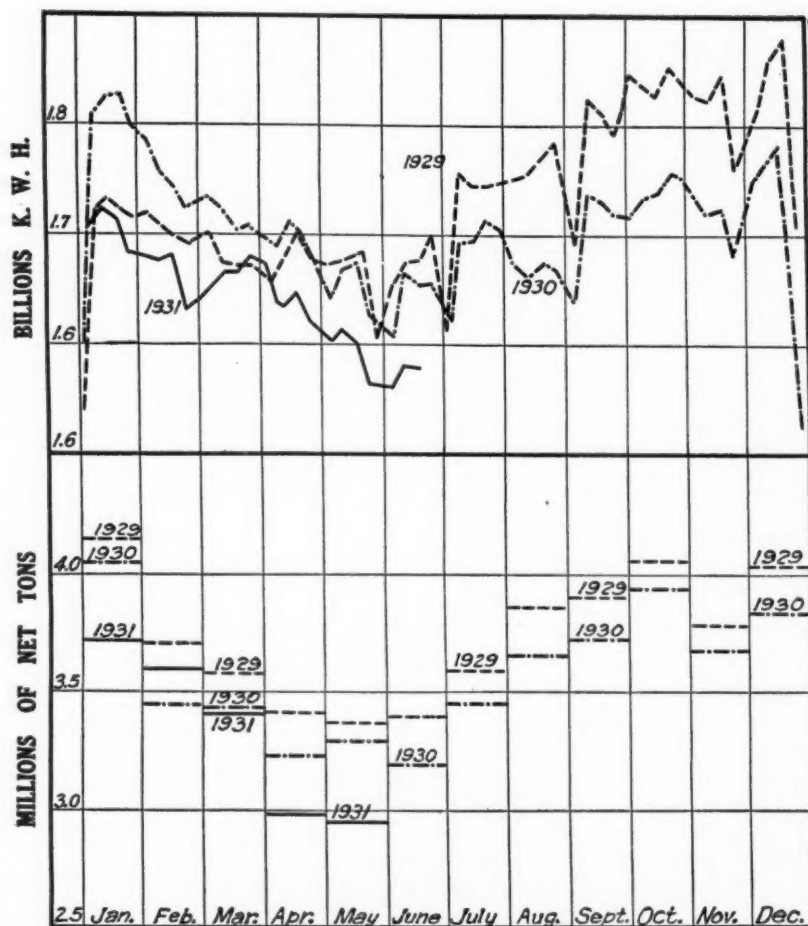


Figure 15—Weekly electric power production curves by the Standard Statistics Company based on data from the National Electric Light Association. Monthly bituminous coal consumption in United States by electrical utilities from the U. S. G. S.

these plants increased their coal consumption 19.8 percent, but in the first 5 months of 1931 coal declined 5 percent, while gas gained slightly and fuel oil waned 11.5 percent, see Figure 14. Actually coal did not suffer a net loss because its volume decrease was parallel to the decline in electric power made. While oil is scarcely a serious fuel factor in this section, its use had a 5 percent net decline though the net gain in natural gas for this purpose was 16 percent in area No. 6 on Figure 1 at the same time.

Wisconsin, being a natural market for lake cargo coal, is individually significant because of industrial density. Here utility electric production in 1930 declined 5 percent below 1929, with the first 5 months of 1931, 13 percent behind those months in 1930. But the volume of power made by fuel is identical in both periods, the proportion of total utility power made by fuel in Wisconsin now being 64 percent against 57 percent a year ago. The volume of

annual coal so used in Wisconsin increased 16 percent from 1927 to 1930, while utility use of fuel oil increased 224 percent for the same period, although the volume in 1930 was only equivalent to 8,538 tons of coal. Nevertheless the tendency is there and the volume of oil in the first half of 1931 was 30 percent ahead of that period in 1930.

Unfortunately, no figures on railroad fuel consumption are immediately available for the area in Group 6 on Figure 1, or for any of the separate states in this division.

We know that since the first of this year there has been increased industrial idleness in this group of states, especially in manufacturing districts, so that the decline in the trend consumption curve for industrial plants on Figure 8 is probably indicative of the general trend in coal consumption throughout district 6 on Figure 1, the period of February-March, 1931, being 13 percent less than 1930. In 1930 there was an

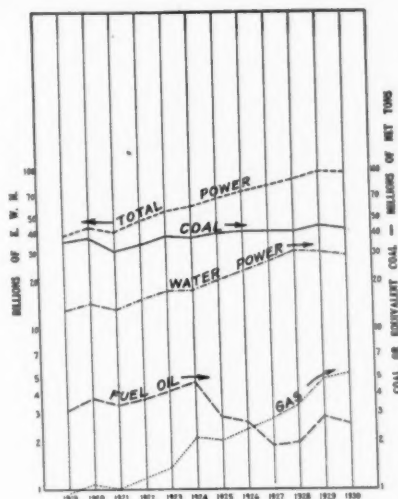


Figure 16—Annual total electric power produced in U. S. with coal and other forms of energy, expressed as equivalent coal, consumed in its generation; data from Power Resources Div., U. S. G. S.

increasing variation of declining demand by industrial plants, as well as in bituminous deliveries to retail coal dealers, which latter curve on Figure 8, in the fall and winter of 1930, was seriously affected by unusually mild weather.

The gradually decreasing consumption curve on Figure 8 for gas coal used in steel and gas works is characteristic for the business conditions that prevailed in this district for the last quarter of 1930 and the early part of this year. To a large degree, the conditions reflected by these declines were identical with those resulting in the heaviest carry-over of bituminous coal on the upper lake docks experienced in several years, accounting for greatly decreased demand this season for lake cargo coal for all purposes.

OTHER CONSUMPTION AREAS

While it is known that coal consumption has been declining generally through the past 18 months, it has not dwindled as fast as coal in storage, as is evidenced by the coal stocks being at a record low point for our national capacity and still continuing the decline.

It is not within the province of an article like this one to make a carefully detailed analysis of prevailing conditions in coal consumption in the different general market areas in the time available for preparing material designed to be of current interest. Referring to Figure 1, the areas shown as 2, 3, 4, 5, 7 and 8 may be studied for current trends in Figures 4, 5, 6, 7, 9 and 10 respectively. The total monthly bituminous coal consumption of railroads, arranged by districts as shown in Figure 2, are charted in Figure 11.

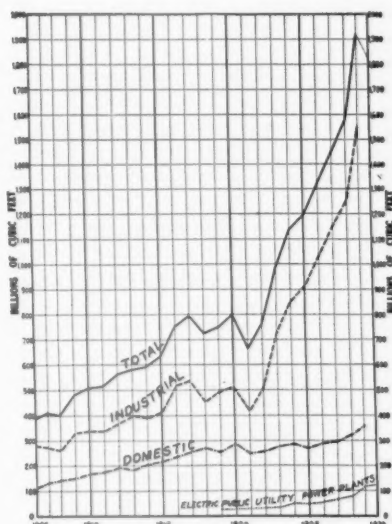


Figure 17—U. S. annual consumption of natural gas with principal classification uses, from Mineral Resources of the U. S. G. S. 1930 total consumption estimated by the Standard Statistics Co.

The respective monthly combined bituminous use trends for the entire country are arranged in Figure 12 for comparison with the trend curves for each of the coal-use areas.

Weekly electric power production, as charted in Figure 15 by the Standard Statistics Company, is an excellent barometer of business generally, and indicates the adverse conditions prevailing this year up to the present. With the electric utility coal consumption plotted for the same periods in this chart, it is noted how closely the consumption of coal for this purpose parallels the average monthly fluctuation of electric power production.

While no data is immediately available to indicate the progress of coal's competitors, supplying energy for making power in the past six months, Figure 16 shows the national trend in sources of energy consumed. While there was but slight decrease in the total volume of power produced in 1930 compared with 1929, natural gas was the only source of energy which showed an increased use last year.

The annual consumption of natural gas in the United States is shown on Figure 17, with the annual increases which have taken place in the principal use classes. An analysis of the domestic consumption of natural gas through the past 24 years shows an increase of five-fold in the number of domestic consumers, while the annual volume of domestic consumption substantially more than doubled in the same period.

SUBSTITUTES AND EFFICIENCY

Since 1929 the hectic development of

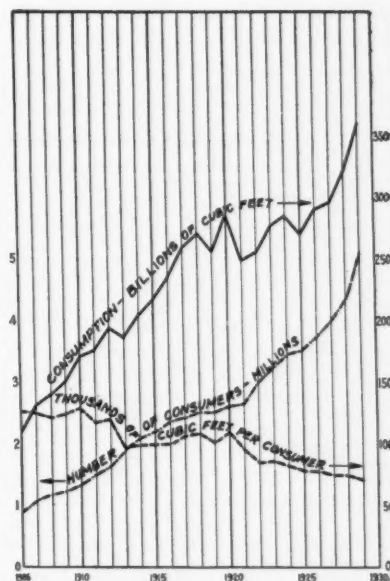


Figure 18—U. S. annual domestic consumption of natural gas to show annual customers and yearly unit consumption, from Mineral Resources, U. S. G. S.

Natural Gas, Oil and Water Power has more than saturated their normal demand, precipitating a flood particularly of oil and gas into markets that would have been available to coal but for the suicidal prices at which these competing fuels are offered. 125 million tons of national power coal markets were lost to these sources of energy in 1929, based on the total use of energy that year, amounting to 19 percent of that year's total potential coal production, if these additional demands had been available to coal.

Also there is the very serious indirect loss to coal through the decrease in railroad freight, as tremendous quantities of oil are delivered in pipe lines instead of tank cars. While the resulting decrease in tonnage is extremely important to the coal industry, it is a still greater factor in the future potential revenue freight volume of the railroads.

Additional losses to coal came through more efficient combustion and better operation by steam plants, railroads, metallurgical mills and other industries, adding about another 100 million tons to the 1929 conditions as they would have been with the 1929 performance demand.

The consumption of coal per 1,000 gross ton-miles of freight was 121 pounds in 1930 compared with 131 pounds in 1927. It has decreased every year, and since 1921 has fallen 25 percent. In passenger train operation coal consumption decreased 17 percent in the same period.

Keen competition in oil freighting navigation, 10 and even 6 cents per barrel quoted (Continued on page 398).

HAULING MORENCI'S MUCK

(From page 390)

leveling bar levels all upwardly protruding objects; the brakeman at the same time thoroughly inspects the train for high loads, timbers, bars, leaks in the air line, bad order cars, and any other defects in train equipment. The inspection may necessitate the stopping and starting of the train from one to four times. The entry to the main line is the next stop but this can not be accomplished unless the block signal is open; the operator must stop the train and await an open signal before entering the main line. With the "all clear ahead" signal the train then makes the trip to the dumping pocket at full speed.

Dumping conditions—The dumping area consists of two pockets 90 ft. long; one on the main line and the other on a side track immediately opposite and parallel to the main line pocket. Upon entering the loading zone the operator stops the train so that as many cars as the length of the pocket will accommodate are placed over the pocket and emptied. This process is repeated until all the cars of the train are loaded. It is then necessary for the operator to uncouple the locomotive from its train, and he goes around the side track and picks up the train so that the locomotive is always pulling the string. Since there is no loop at the dumping pockets, the necessity of switching around is readily seen. There are times when the dumping area becomes congested. Relieving the congestion is a very simple matter. The first train, not having completed its discharge, is pushed ahead by the locomotive of the second train after the locomotive of the first train has been uncoupled and is stationed on the side track. The No. 1 locomotive then picks up its string and pulls it over the pocket on the side track and completes the unloading. When the occasion arises and a third train enters the dumping area, the foregoing process is repeated, and the No. 3 locomotive clears the main line, allowing the No. 1 locomotives and its string to return to the loading area, with a minimum of dead time. This process of relieving the congestion unquestionably works a hardship on the locomotives, since the incoming locomotive is called upon to push the partially unloaded string of cars ahead, in addition to the regular duty of pulling its own string. This overloading, however, is for a very short period, and there has been no ill effects noted on the locomotives.

On the fourteenth level the rail laid is 60-lb. steel, the curves are 100 to 120-ft. radius, and the grades are 0.4 percent with the load. This is on one-drift level and all the chutes are in one drift. This layout makes it necessary for the locomotive to load its entire string without the

aid of a snap motor. There are two 70-ft. dumping pockets placed on a loop on this level in the dumping zone. The loop greatly eliminates the possibility of a tieup of haulage equipment. The same inspection practice is adhered to on this level as on the haulage level above.

Derailed cars, the wheels of which are too far from the rails to be rerailed in less than three placements of the rerailers are easily and quickly rerailed with the aid of a locomotive. This is accomplished by placing a timber under the reenforcing angle which rims the top of the car body and on the footboard of the locomotive. The timber acting as a jack lifts the car back on to the rail as the locomotive approaches the car.

The writer wishes to express his appreciation for the assistance given him by Messrs. Frank Ayers, manager; McHenry Mosier, mine superintendent; and C. G. Grim, superintendent of transportation; also George F. Carr, assistant mine superintendent.

SPRING HILL MINE

(From page 388)

highway for trucks and passenger cars. The employees are transported from Helena to the mine and back in a long-wheelbase Ford truck with a stake body and equipped with benches lengthwise of the body and covered with a canvas tarpaulin for protection from inclement weather. Thirty men can be accommodated in the truck at one time, and the small number of men remaining on either shift use their own cars or are given a small allowance for their use in the case of the men on the three mill shifts.

A short-wheelbase Ford truck serves to transport material and supplies from Helena to the mine and between buildings at the property. The truck is ordinarily used with a stake body, but a rough box body is used when handling sand, coal, and like material.

The transportation of concentrates from the mill to the railroad cars in Helena is under contract to a trucking company. A mill road of not more than a 6 percent grade from the highway in the gulch to the mill was built in order to facilitate handling large loads of concentrates regardless of road or weather conditions. The trucking company has provided a loading platform at the railroad sidetrack where the truckloads of concentrates are dumped directly into tight-bottom gondola cars furnished by the railroad for the service. Approximately nine tons of concentrates are hauled in one load with a large dump body truck, and five such truckloads constitute a carload shipment. The time required for transporting a carload shipment from the mill to the shipping point is a little less than eight hours.

CURRENT TRENDS IN COAL

(From page 397)

now in Texas for oil gives small hope now for the recapture of this lost business. However, with the growing use of improved equipment for the smokeless and more efficient combustion of high volatile coal, new markets will eventually be created. But this is in the distance.

PROSPECT

At this first of August the national retail coal dealer is getting a little more interested in the current emptiness of his yard. The purchasing agent is not so apathetic about his dwindling stock pile as he was even a month ago.

In spite of mild weather in this year's first quarter, retail yards now show more than normal bareness. Industrially, coal consumption is slightly higher than production; then, too, there is the prospect of an increase in freight rates—all factors favorable to more than seasonal improvement for this year's last quarter.

Following are the principal sources of information used: Statistics Section, Coal Division, U. S. Bureau of Mines; Standard Statistics Co.; Mineral and Power Resource Divisions, U. S. Geological Survey; U. S. Department of Commerce Year Book; Bureau of Railway Economics, American Railway Association; "Electrical World" and National Electric Light Association.

"Mine Sampling and the Commercial Values of Ores," a guide for prospectors, by Prof. R. S. Lewis, has just been issued as Bulletin No. 10 (revised) by the Department of Mining and Metallurgical Research of the University of Utah. With so many otherwise jobless men hurrying to the hills just now, this is a particularly timely publication.

"Under the joint agreement, the United States Bureau of Mines, the Utah chapter of the American Mining Congress, and the University of Utah have been making qualitative tests of samples sent in by prospectors," states Professor Lewis. "So many of the samples sent in were worthless because they were improperly taken, and so many wrong ideas were held by prospectors regarding the value of a mineral claim, that the bulletin was written as a simple guide for prospectors in taking samples and estimating the value of ores."

Sketches, figures and tables are used to illustrate the points discussed, and a brief discussion of smelter contracts and their application to valuing ores is given at the end. Copies may be obtained from the director of the Engineering Experiment Station, University of Utah, Salt Lake City. The price per copy is 35 cents.

NEWS OF THE MINING FIELD

Phelps Dodge and C. & A. Agree on Merger Terms

After more than a year of negotiations, directors of Phelps Dodge Corporation and the Calumet & Arizona Mining Company reached an agreement July 16 on terms for consolidation of the two companies, subject to approval of stockholders of both companies.

A formal statement said that it is proposed that "after a payment of \$2.50 a share by the Calumet and Arizona Mining Company to its stockholders, the properties and assets of the Calumet and Arizona Mining Company be merged with the Phelps Dodge Corporation, upon payment by the Phelps Dodge Corporation of 3¼ shares of its stock for each share of Calumet."

The merger will unite two companies which, as of December 31 last, reported combined assets totaling approximately \$370,000,000, and which in 1930 sold 358,743,536 pounds of copper.

Calumet & Arizona has a producing capacity of roughly 63,570 tons of copper, while Phelps Dodge Corporation has a somewhat higher capacity.

The Phelps Dodge Corporation's principal mines are at Bisbee adjoining the mines of C. & A., at Clifton-Morenci, in Arizona, and at Nacozari, Sonora, Mexico. It also owns the Burro Mountain copper property near Silver City, and coal mines at Stag Canon, N. Mex.

Phelps Dodge controls Nichols Copper Company, owning a refinery at Laurel Hill, Long Island, a new refinery at El Paso, completed about a year ago where the copper from the Phelps Dodge and the Calumet & Arizona properties is refined, and an interest in the new refinery at East Montreal, Canada.

The Nichols copper refineries at Laurel Hill and at El Paso have an annual capacity of 300,000 tons of electrolytic copper and the East Montreal, Canada, refinery has a capacity of 75,000 tons.

Phelps Dodge Corporation also controls National Electric Products Corporation, which has annual capacity of 200,000,000 pounds of copper and brass products.

The present Calumet & Arizona Company was incorporated in Delaware in 1929 to effect a consolidation of the company under the main property acquired

by the new company from the former Calumet & Arizona at Bisbee, Ariz., adjoining the Copper Queen mine of Phelps Dodge.

Its holdings also include the Eighty-five mine at Valedon, N. Mex., an area in the Bunker Hill district of Arizona; a smelter at Douglas, Ariz., and the Verde Central Mines, Inc., a subsidiary with property adjoining United Verde, which recently made a bid for the property. The new Cornelia mine at Ajo, Ariz., is an important low-cost property of the disseminating ore type.

Calumet & Arizona has outstanding 842,857 shares of \$20 par capital stock.

In addition to ranking as one of the world's largest copper producers, Phelps Dodge is an important producer of lead, silver and gold. It has no funded debt and its capital stock, of one class only, consists of 2,000,000 shares of \$25 par value, which stockholders recently voted to increase to 3,000,000 shares.

WAR MINERALS CASES Up for Decision Soon

Decision will be made by the Supreme Court early in its new term beginning in October in cases involving the right of war mineral claimants to recover losses in the purchase of property and interest on borrowed capital in producing minerals at Government request during the war. Of 161 docketed cases, these suits are numbers 66 and 67 on the calendar and will be reached for argument and decision early in the term under the system of hearing cases in the numerical order of their docketing.

The suits were won in the District of Columbia Court of Appeals by the Vinicator Consolidated Gold Mining Company and the Chestatee Pyrites and Chemical Corporation, and were appealed by the Government at the request of the Interior Department to the Supreme Court, whose forthcoming ruling will be final and settle a long standing dispute as to whether these claims are allowable under war mineral relief legislation. The department had refused to pay these claims.

Muscle Shoals Commission Appointed

President Hoover announced the appointment of a commission to determine a method of developing the Muscle Shoals project, representing the Federal Government and the states of Alabama and Tennessee. The commission was proposed by the President on March 3 when he vetoed the Norris resolution providing for Government operation of the enterprise. It will have no power to lease the Government-owned plants, its duty being to prepare a report for the consideration of Congress.

Representing the Government—Col. H. B. Ferguson and Col. J. I. McMullen, of the War Department, and E. A. O'Neal, of Alabama, president of the American Farm Bureau Federation.

Tennessee—Mercer Reynolds, Chattanooga; V. J. Alexander, Nashville, and W. A. Caldwell, Jackson.

Alabama—W. F. McFarland, Florence; I. U. Duncan, Auburn, and S. F. Hobbs.

The three groups will work together in an effort to determine how the property can be made of use to the South.

Pan-American Conference to Discuss Silver

The silver problem will be discussed at the Fourth Pan-American Commercial Conference which will meet in Washington, October 5 to 12, under the auspices of the Pan-American Union, bringing together commercial leaders from 21 American republics. With Mexico, the United States and Peru accounting for 70 percent of the world production last year, consideration of the silver problem by representatives of these three nations at the forthcoming commercial conference "undoubtedly will have an important effect on any future negotiations on the silver situation," it was stated by the Pan-American Union.

A conference of British bankers, industrialists and exporters to consider long term credits to China and cooperation between British and Chinese capital in China's industrial machinery trade, has been recommended by the British Economic Mission which recently concluded a survey in China. Suggestion is made that British iron and steel manufacturers maintain resident experts in

Japan and China. It is also recommended that there be group organizations in China of British machinery exporters to prevent wasteful inter-British competition and strengthen British representation.

United Verde Extension Strikes Rich Copper Vein

A rich copper vein in the old Haynes claim at Jerome, Ariz., has been struck by the United Verde Extension Mining Company, it was stated early in July.

The ore is said to average about 7 percent copper with some of it running up to 10 percent, and about \$1 a ton in gold. The management of the company has not determined the size of the ore body, it is said, as its development has not proceeded far enough, but it is understood to believe that the prospect is worth while.

United Verde purchased the Haynes claim about 10 years ago, but no attempt was made to develop it. The mine of the United Verde Copper Company separates the Haynes claim from the other property of United Verde Extension at Jerome. To save the expense of sinking a shaft on the Haynes property an arrangement has been made with United Verde Copper to run a drift from its mine at the 3,000-ft. level into the Haynes property.

The company shut down operations at its main property on July 1 for a period of three months.

Canadian Copper Refinery

The \$3,000,000 plant of the Canadian Copper Refiners, Limited, in Montreal East and the new \$1,000,000 plant of the Canadian Cable Wire Company at the same location were opened on June 25, according to the Commerce Department. The refinery will have a capacity of about 75,000 tons of copper a year and 720,000 ounces of silver. The wire factory is capable of producing 80,000,000 pounds of copper wire per year.

Princeton Geology Class in Canada

Twenty-two students in geology at Princeton University are now touring Canada over the Canadian National Railways in the special car "Princeton." The group is being led by Dr. Richard M. Field, dean of the department of geology, Princeton University, and Prof. Erling Dorf, of Princeton. Dr. Alfred G. Lane, president of the American Geological Society and head of the department of geology, Tufts College, is accompanying the party.

The party is travelling as the International Summer School of Geology and

Natural Resources and in addition to studying various geological formations in northern Quebec, Ontario, the Rockies and coast ranges, they will inspect a number of the important mining properties in eastern and western Canada.

Their first inspection will be of the mines at Cobalt, and following that, the Noranda property at Rouyn in northern Quebec. From Rouyn they will proceed to the Porcupine gold district where they will visit the famous Hollinger and MacIntyre mines. After touring eastern Canada they will continue west to Alberta. From there they proceed to the Pacific Coast, and arrive at Vancouver on August 11.

The return trip will be made through the United States via the Grand Canyon.

VALUE OF FIRST-AID TRAINING Emphasized in New Motion Picture Film

The value of a practical knowledge of first-aid methods is strikingly emphasized in a new one-reel educational motion picture film entitled, "Learn and live," prepared by the United States Bureau of Mines in cooperation with an industrial concern.

Daily occurrences in the life of a mine official and his family are picturized to impress the lesson of safety first and the value of first-aid training. The scenes illustrate interesting and valuable first-aid methods, including artificial respiration; control of bleeding; treatment for shock; the dressing of wounds, etc.

Copies of this practical safety film "Learn and Live" may be obtained for exhibition purposes by clubs, schools, churches, business and safety organizations, miners' local unions, and others interested by applying to the Pittsburgh Experiment Station of the United States Bureau of Mines, Pittsburgh, Pa. No charge is made for the use of the film, although the borrower is asked to pay transportation charges.

World Lead Production

World production of lead in June was 120,240 short tons against 123,639 in May, 131,926 in April and 150,541 in June, 1930, according to the American Bureau of Metal Statistics. Total production for first six months was 807,244 tons, against 926,837 in first half of 1930.

Asbestos Output Higher

The commercial production of asbestos (figures available for chrysotile only) in the United States in 1930 increased 84 percent in quantity, but declined 14 percent in total value, in comparison with 1929. With the exception of 1911, the 1930 production was the largest output of chrysotile ever recorded in the United States. According to figures compiled by the Bureau of Mines from individual reports furnished by producers, the total quantity of chrysotile sold or used by producers in the United States in 1930 was 3,653 short tons, valued at \$273,292, as compared with 1,983 tons, valued at \$317,584, in 1929.

The total average value, per ton, of chrysotile in 1930, including all grades of crude and mill fiber, was \$74.81. In 1929 the corresponding value was \$160.15. The marked decline in average value in 1930 is partly accounted for by the decrease in production of high-grade Crudes Nos. 1 and 2, mined only in Arizona, and by the increased production of the lower grades of mill fiber produced in Arizona, California, and Vermont.

A preliminary report has been issued by the Bureau, covering domestic market conditions, prices, imports and exports, world production and domestic consumption. Copies furnished upon request to THE MINING CONGRESS JOURNAL.

Tax Decisions

In deciding the case of the Petroleum Exploration Company of West Virginia, involving taxes of \$21,706 for the years 1925 to 1927, the Board of Tax Appeals rules that amounts expended by the company in drilling productive wells and freight, haulage and labor expenses involved in installing equipment in the wells, which costs were capitalized are recoverable through depreciation rather than through depletion. In doing so the board reversed the decision of the Internal Revenue Bureau.

In deciding the case of the Indian Creek Coal & Coke Company, of Pittsburgh, involving taxes for 1922, 1924, and 1925, the board values the coal properties at \$100 per acre on March 1, 1913, for depletion purposes and rules that royalties to be applied, in case of purchase of properties, to the purchase price, retain their character as royalties.

In the case of S. W. Forrester, of Kansas, involving taxes of \$224,709 for 1919 and 1920, the board allows the cost of leases on oil property as a deduction upon evidence that the leases were worthless and that they expired within the tax year, but disallows a deduction as a loss of the cost of other leases which did not expire until after the tax year.

New Railroad in Cuba to Tap Manganese Mines

The Consolidated Railroads of Cuba has entered into a contract for the construction of a new branch line which will connect its main line with the properties of the Cuban Manganese Corporation, in which the Freeport Texas Company recently acquired a controlling interest. The company's manganese deposits, which are extensive, are located near Cristo, 16 kilometers north of Santiago on the Cuba Railroad main line.

The Cuban Mining Corporation proposes to immediately develop and operate the manganese deposits.

E. L. Norton, president of the Manganese Corporation, recently announced the company plans to erect a plant on the property capable of treating 1,000 tons of ore daily by a new patented process recently perfected by engineers of the company in collaboration with the B. F. Goodrich Company.

Postpone Hearing on Metal Freight Rates

The interstate commission has announced that further hearing will be held in Chicago on October 14 in connection with part 12 of the general investigation on nonferrous metal freight rates before Commissioner Eastman and Examiners Mullin and Copper.

In connection with this announcement, the commission says, "Postponement to this date is at the request of the carriers and in the hope that they will then be able to submit a definite proposal with reference to the rates in issue. It is understood that the carriers at the request of interested shippers agreed to defer the making of any proposal until the shippers' evidence had been fully presented and thoroughly studied. It is expected that any evidence which the commission may wish to present will be offered at the October hearing."

Engineer Council Urges Reorganization of Topographic Mapping System

The richer states are benefiting at the expense of the poorer in the distribution of Federal funds for topographic mapping, according to the American Engineering Council.

Acting upon the recommendation of its public affairs committee, of which R. F. Schuchardt, of Chicago, is chairman, the council, it is announced, will work for "the removal of restrictive clauses in the appropriation bills which hinder or defeat the Temple act of 1925," providing for the completion of

AMERICAN MINING CONGRESS, WESTERN DIVISION To Meet at Joplin September 28, 29, 30

Plans are rapidly being completed for the annual meeting of the Western Division of the American Mining Congress at Joplin, Mo., September 28, 29 and 30. At the same time the Tri-State Section of the American Institute of Mining and Metallurgical Engineers will hold its meeting. The Institute will hold its meetings and have charge of the program on the first day of the meeting. The second day is given over to the sessions of the Western Division of the Mining Congress, and the third day will be featured by a tour of the Tri-State field.

S. Livingston Mather, of Cleveland, vice president of The Cleveland-Cliffs Iron Company, president of the American Mining Congress, and a leader in the iron ore industry, will be among a group of leaders in the mining industry who will discuss timely subjects of interest to the mining and business world. Mr. Mather will speak on what the mining industry is doing to promote industrial prosperity and his address promises to be of nation-wide interest.

Other subjects to be considered at the sessions of the Western Division are, "Silver and World Prosperity," to be presented by W. Mont Ferry, of Salt Lake City, president of the American Silver Producers Association; "Commission Regulation versus Private Operation of Minerals," by Robert E. Tally, of Clarkdale, Ariz., vice president and general manager of the United Verde Copper Company, and former president of the American Mining Congress; "Varied

Problems Facing Mineral Producers," by J. F. Callbreath, of Washington, D. C., secretary of the American Mining Congress; "Stabilization of the Natural Resource Industries," by Dean Frank H. Probert of the University of California; "National Revenue and Mining," by A. W. Dickinson, chief of the tax division of the American Mining Congress; "What the Lead Industry is Doing to Help Itself," by Ralph M. Roosevelt, vice president of the Eagle-Picher Lead Company.

The joint meeting is expected to attract between 600 and 700 delegates and visitors, not only from the United States but also from Canada and Mexico.

A smoker is planned for the first night, for which an elaborate program of entertainment is being arranged. On the second night, September 29, the annual banquet will be held at the Connor Hotel, with Charles Neal, of Miami, as toastmaster. On the last day, following the tour of inspection of the mining district, the party will move on to Miami where arrangements have been made to hold a barbecue.

Arrangements for the convention are in charge of C. F. Dike, chairman of the board of governors of the Western Division, and M. D. Harbaugh, secretary. Others on the committee in charge of arrangements are: C. N. Anderson, S. H. Davis, George Fowler, J. E. Harsh, Karl Koelker, Wade Kurtz, W. T. Landrum, M. H. Loveman, Charles Neal, George W. Potter, F. C. Ralston, and Jesse G. Starr.

the topographic mapping of the United States within 20 years.

Sufficient appropriations to carry out the intent of the Temple act will also be urged upon Congress by the council, which points out that the present 50-50 arrangement between the Federal Government and the states is resulting in injustice.

Every state, it is held, should have topographic mapping done within its borders whether it is able to cooperate financially or not.

Placer Mining Active in Mountain States

Placer mining in Colorado, New Mexico, Arizona, South Dakota and Idaho is showing renewed activity as the result of a new rule put in effect by the United States mint regarding the purchase of

gold, according to Frank E. Shepard, superintendent of the Denver mint.

Under the new rule the mint will accept as little as two ounces of mined gold, worth about \$40, at a time. Formerly no amount smaller than \$100 worth could be accepted. The new rule does not apply to scrap gold.

"While no figures are yet available, the new rule is stimulating interest in small placer operations," Shepard said.

World Copper Output Lower in June

World smelter production of copper showed a decline in June, the report of the American Bureau of Metal Statistics shows.

The total for June was 126,722 short tons, compared with 130,486 tons in May and 150,697 tons in June of last year.

Arizona Mine Valuation Lower

Tentative valuation figures on Arizona producing mines, to be used for 1931 taxation purposes, announced by the state tax commission, show the total values have dropped \$29,527,034 under last year's final assessment figures.

The announcement, made by Frank Luke, chairman of the tax commission, gave the 1931 valuation at \$245,279,727, as compared to \$274,806,761 last year.

Seventeen mines in seven counties are listed as operating.

Helium Investigation in Michigan Copper District

Dr. W. D. Urry, of Johns Hopkins University, is in the Michigan copper district to start an investigation of the amount of helium in the rocks for the purpose of calculating their age. Dr. Urry worked with Professor Paneth in Germany, and together they refined the methods of determining extremely small quantities of helium, to the ten millionth of a cubic centimeter, a number of technical papers having been published in regard to their work.

The Michigan College of Mining & Technology at Houghton and the several mining companies of the district are co-operating by assisting Dr. Urry to collect specimens.

The helium is produced by the disintegration of radium, and upon the ratio of helium to radium Paneth and Urry have made estimates of the age of various meteorites, which vary up to about three thousand million years. It is now proposed to apply the same methods to copper and the rocks which contain it. Dr. Urry will not be able to give any results while there, as he is only taking rock samples, under special precautions, to be later submitted to a refined analysis, for which purpose he must take them to Germany.

Manganese Price Drop Blamed on Russia

Russian manganese and depressed conditions in industry are credited by the Commerce Department with depressing manganese ore prices.

Reviewing the current international manganese situation, the department said prices had been steadily declining and production also had dropped.

The review said "Russia, holding a leading position with reserves of high-grade ore estimated to be greater than those of any other country, has consistently increased its annual output in recent years and many of the large consumers of manganese ore have covered

their requirements for 1931 through negotiations with Russian contributors.

"Brazil's decline in annual output during the last few years as well as a comparable decrease in exports may be attributed definitely to the competition and lower prices offered by Russia. India's trade, likewise, declined for the same reason. Several Indian mines have ceased operations during the last year.

"Of all the manganese producers the Gold Coast has best maintained its position in competition with Russia. In 1930 exports from the Gold Coast of about 417,970 tons showed a decrease of about

1,730 tons from 1929. In the same year the United States became the second best purchaser of Gold Coast manganese with Norway first, Canada third and France fourth.

"As indicated, none of the major industrial countries, which are the principal users of manganese, produces a sufficiency to meet the requirements of its steel industries except Russia, the only large consumer, which has a surplus for exportation."

United States production of manganese amounted to 69,373 metric tons in 1930 compared with 63,701 tons in 1929 and 49,159, in 1928.

SILVER, COPPER, LEAD, AND ZINC In the Central States in 1930

The following statistics of silver, copper, lead, and zinc in the Central States in 1930, were compiled by J. P. Dunlop, of the United States Bureau of Mines.

TENOR OF CRUDE LEAD AND ZINC ORE AND CONCENTRATES PRODUCED BY REGIONS

	Wisconsin	South-eastern Missouri	South-western Missouri	Kansas	Oklahoma
Total crude ore, tailings, etc., milled—short tons..	486,400	6,681,300	328,800	3,517,300	7,213,600
Total concentrates in ore, etc.:					
Lead—percent	0.44	4.15	0.40	0.57	0.54
Zinc—percent	10.6	0.13	3.89	4.10	3.72
Metal content of crude ore:					
Lead—percent	0.32	3.03	0.31	0.44	0.42
Zinc—percent	3.34	0.07	2.25	2.42	2.19
Average lead content of galena concentrates—percent	73.5	73.0	76.0	77.7	76.8
Average lead content of lead carbonate concentrates—percent .....	....	....	60.0	58.7	....
Average zinc content of sphalerite concentrates—percent	31.6	58.2	60.0	58.9	58.8
Average zinc content of silicates and carbonates—percent	43.0	....	40.1	....	....
Average value per ton:					
Galena concentrates	\$60.90	\$59.64	\$59.39	\$67.63	\$64.68
Lead carbonate concentrates .....	....	....	53.40	45.23	....
Sphalerite concentrates	13.0	18.80	33.55	31.26	30.09
Zinc silicates and carbonates	27.77	....	24.0	....	....

Only tailings were milled in Illinois in 1930. Shipments were 30 tons of sphalerite averaging 38.9 percent zinc.

The galena from southern Illinois (379 tons) had an average lead content of 66.8 percent, and that from Kentucky (184 tons) had an average lead content of 66 percent.

Copper ore from Michigan amounted to 6,659,036 tons and yielded 1.27 percent of copper. The quantity of concentrates produced from the treatment of this ore was 258,005,986 pounds.

MINE PRODUCTION OF SILVER, COPPER, LEAD AND ZINC

State	Silver		Copper	
	Fine ounces	Value	Pounds	Value
Illinois	1,797	\$692	....	....
Michigan	7,820	3,011	169,381,413	\$22,019,584
Missouri	170,210	65,531	176,600	22,958
1930	179,827	69,234	169,558,013	22,042,542
1929	206,133	109,869	186,404,458	32,807,181

State	Lead		Zinc		Total value
	Short tons	Value	Short tons	Value	
Arkansas	53	\$5,300	....	....	\$5,300
Illinois	248	24,800	9	\$864	26,356
Kansas	12,910	1,291,000	74,304	7,133,184	8,424,184
Kentucky	101	10,100	....	....	10,100
Michigan .....	....	....	....	....	22,022,595
Missouri	199,632	19,963,200	10,811	1,037,856	21,009,545
Oklahoma	23,052	2,305,200	136,153	13,070,688	15,375,888
Wisconsin	1,537	153,700	12,558	1,205,568	1,359,268
1930	237,533	23,753,300	233,835	22,448,160	68,313,236
1929	273,895	34,510,770	329,935	43,551,420	110,979,243

Value computed at the following average prices for 1930: Silver, \$0.385 per ounce; copper, \$0.13 per pound; lead, \$0.05 per pound; zinc, \$0.048 per pound.

(The production, tenor of ore and average prices for old tailings, etc., and for crude ore treated in 1930 in Kansas and Oklahoma are given separately in the Bureau of Mines report, together with the mine production of lead and zinc in the Central States by regions. THE MINING CONGRESS JOURNAL will furnish copies upon request.)

Personals —

DANIEL M. KELLY has been appointed general western counsel for the Anaconda Copper Mining Company, it was announced July 6, by J. R. Hobbins, vice president of the company. Mr. Kelly has been a prominent member of the company's legal staff since 1915, and succeeds to a large part of the functions formerly performed by the late L. O. Evans.

He is well known throughout Montana and the West, and has been prominent in some of the most extensive and important mining litigation of the West, a notable instance being his participation as counsel for the Anaconda Company in the famous Poser case, involving the Clark and the Anaconda Company interests.

Mr. Kelly is head of the Minerals Section of the American Bar Association and is an authority on mining law. He resigned as attorney general of Montana in 1914 to accept a position in the legal department of the Anaconda Company, where he has remained since. He represented Silver Bow County in the Montana legislature in the session of 1919.

JAMES MACNAUGHTON, of Calumet, president of the Calumet & Hecla Consolidated Copper Company, has been appointed by Governor Brucker, of Michigan, as chairman of the Isle Royale National Park Commission, authorized by the 1931 Michigan legislature. The commission is responsible for acquiring and transferring to the Interior Department all the private lands on Isle Royale with as many of the small islands that surround it as may be necessary for a national park.

Isle Royale is 45 miles long and lies in Lake Superior about 40 miles south of Port Arthur, Canada. It is hailed as "one of the few remaining tracts of magnificent wilderness in the United States."

EDWARD J. BLOOM, of the Bunker Hill & Sullivan Mining & Concentrating Company, Wallace, Idaho, stopped off in Washington, July 25, while on his way to New York to act as instructor in the application of mining law with the Princeton University Summer School trip to British Columbia. Mr. Bloom will deliver a series of lectures on the train en route. The school is housed in an especially designed Pullman car and left New York, July 27, for its 1,000-mile tour to mines in Canada and northern United States.

SENATOR KEY PITMAN, of Nevada, sailed from China, July 24, after spending several months in the Orient making a first-hand study of the silver situation. It is understood that plans are under way for a conference to consider the silver problem to be held in San Francisco early in August, upon the Senator's arrival. Another conference, under the auspices of the Northwest Mining Association, is planned for some time in September, at Spokane.

At a meeting of the executive committee of the International Nickel Company of Canada, Limited, held July 20, in New York, J. C. NICHOLLS, of Copper Cliff, was promoted from general manager to assistant to the president at Toronto, and DONALD MACASKILL, of Copper Cliff, was promoted from manager mining and smelting division to general manager. DR. JOHN F. THOMPSON, assistant to the president, was appointed vice president.

Both Dr. Thompson and Mr. MacAskill have been with the company or the predecessor companies for a quarter of a century, while Mr. Nicholls joined the company in 1913. Mr. MacAskill came to Canada from Scotland and has worked his way up from the bottom. Mr. Nicholls, a mining engineer of excellent reputation, has worked in the South African gold mines. Since joining the company he has been connected with all the nickel mining developments.

DR. DORSEY A. LYON, director of the Utah Engineering Experiment Station, University of Utah, was elected president of the Utah Society of Engineers at their annual banquet-meeting, June 25.

CARL SCHOLZ, of Charleston, W. Va., has been appointed consulting engineer for the Elk River Coal & Lumber Co., with mines at Widen, W. Va.

The President has reappointed WILLIAM E. HUMPHREYS as a member of the Federal Trade Commission.

JAMES RAUB has been appointed superintendent of the Alden Colliery of the Alden Coal Company in Luzerne County, Pa. He succeeds the late William S. Norton.

ELLERY B. GORDON has been named acting head of the Statistics Section, Coal Division of the U. S. Bureau of Mines. F. G. TRYON, who is head of this section, has been assigned to President Hoover's

Research Committee on Social Trends for a three months' period.

LONDON C. BELL was recently elected chairman of the board of the Red Jacket Consolidated Coal & Coke Company. Other officers are: W. M. Pryor, president; J. W. Mayhew, assistant to president; E. R. Ritter, vice president and general manager, and I. D. Cook, vice president in charge of sales.

N. D. MOORE has been chosen president of the Pacific Coast Coal Company, subsidiary of the Pacific Coast Company, Seattle Wash., and G. W. Mertens and D. S. Hanley as vice presidents.

Obituary

John Lyons Agnew, vice president of the International Nickel Company, of Canada, Limited, died at his home in Copper Cliff, Ont., July 8. Death was due to heart failure in a sudden attack of influenza. He had just returned to his home from a business trip to New York.

Mr. Agnew was in charge of the company's operations in both Canada and Great Britain. Among the offices which he held in the parent and subsidiary companies were: Vice president, director and member of the executive committee of the International Nickel Company, of Canada, Limited; director of the International Nickel Company, Inc. (the operating company in the United States). He likewise served as deputy chairman and director of Ontario Refining Company, Limited, in which the nickel company has 42 percent interest; and he was also a director of the Bank of Toronto.

Born July 28, 1884, Mr. Agnew was brought up in the mining and metallurgical atmosphere of the Pittsburgh district. Going to Canada when he was about 19, he joined the predecessor company—the Canadian Copper Company—at Copper Cliff, Ont., on February 15, 1904. He worked in practically every capacity in the smelting department, eventually becoming smelter superintendent. Subsequently he became general superintendent of the Canadian Copper Company. From then on he held executive positions in the various companies which existed prior to the consolidation in 1929 of these enterprises as the International Nickel Company of Canada, Limited. At that time he became vice president of the new company.

Mr. Agnew directed the opening and development of the Froid mine, which is the largest nickel mine in the world; the construction of the new smelter at Copper Cliff; the extension of the hydroelectric development on the Spanish River, and the enlargement of refining operations at Port Colborne, Ont. Besides his widow, he is survived by two daughters.

ters and a son. He became a naturalized Canadian citizen recently. He was a member of various technical organizations and was a past president of the Ontario Mining Association and of the Canadian Institute of Mining and Metallurgy.

Martin J. Caples, of Norfolk, Va., former member of the Board of Governors of the Southern Division of the American Mining Congress, representing Virginia, died July 29, at Mercer Hospital, Trenton, N. J. Mr. Mercer was a former vice president of the Seaboard Air Line Railroad.

Feldspar in 1930

The crude feldspar sold or used by producers in the United States in 1930 amounted to about 171,788 long tons, valued at \$1,066,636, or \$6.21 a ton, as announced by the Bureau of Mines, which has collected statistics in cooperation with the Geological Surveys of New York, North Carolina, South Dakota, and Virginia. These figures show a decrease of 13 percent in quantity and 16 percent in total value in comparison with 1929. Feldspar was reported as having been mined and sold in 1930 in 10 states, namely, California, Colorado, Connecticut, Maine, New Hampshire, New York, North Carolina, Pennsylvania, South Dakota, and Virginia. The greatest feldspar-producing region is that which includes the Atlantic Seaboard states, from Maine to North Carolina. This region reported about 91 percent of the total output and value in 1930. North Carolina, the leading state, reported 60 percent of the total output; Maine, the

second state, reported 13 percent; and New Hampshire, the third state, 10 percent. The average value per long ton in North Carolina was \$5.75; in Maine, \$7.11; and in New Hampshire, \$8.01.

Except for minor purposes, feldspar is prepared for use by grinding. This work is done principally by commercial mills; only a very small portion is ground by users in their own mills. In 1930 there were 34 commercial mills operated in 12 states, namely, California, Colorado, Illinois, Maine, New Hampshire, New Jersey, New York, North Carolina, Ohio, South Dakota, Tennessee, and Virginia. These mills reported 181,541 short tons of ground feldspar sold in 1930, valued at \$2,450,915, or \$13.50 a ton, compared with 230,582 tons, valued at \$3,296,252, or \$14.30 a ton, in 1929, a decrease of 21 percent in quantity and of 26 percent in total value. Of the quantity of ground spar sold in 1930, 167,380 short tons, valued at \$2,167,352 (or \$12.95 a ton) was domestic feldspar, and 14,161 tons, valued at \$283,563 (or \$20.02 a ton) was imported feldspar. These figures represent a large decrease in imported feldspar ground as compared with 1929.

The production of crude feldspar by states in 1929 and 1930 is shown in a table prepared by the Bureau of Mines. THE MINING CONGRESS JOURNAL will furnish copies upon request.

Platinum and Allied Metals in 1930

The platinum refiners of the United States in 1930 purchased 797 ounces of crude placer platinum of domestic origin and 44,765 ounces of foreign crude platinum, according to the Bureau of Mines. In 1929 the refiners purchased 516 ounces of domestic crude platinum and 51,618 ounces of foreign crude platinum.

Domestic material purchased in 1930 included 513 ounces from Alaska, 236 ounces from California, 10 ounces from Oregon, and 38 ounces from unspecified sources. Purchases of foreign crude platinum in 1930 were 547 ounces from Australia, 6 ounces from Canada, 40,520 ounces from Colombia, 2 ounces from Russia, and 3,690 ounces from South Africa.

Refined platinum metals recovered in 1930 from crude platinum, from ore and concentrates, and from gold and copper refining amounted to 43,502 ounces, of which 9,308 ounces was reported to have come from domestic materials.

The Bureau of Mines report covers prices for the year for refined platinum, iridium, palladium and rhodium; detailed tables give new and secondary platinum metals recovered by refiners in the U. S. from 1926 to 1930, imports for 1929 and 1930 and stocks of refiners for the past 10 years. Copies may be obtained through THE MINING CONGRESS JOURNAL.

Explosives Institute Adopts Release Forms

The Institute of Makers of Explosives has devised two forms of release from liability for any damage which may be done by blasts supervised by explosives manufacturers' field men, where conditions may occur which can neither be foreseen nor guarded against. These forms have been adopted to avoid any questions or controversies which might arise in these matters and the users of explosives accepting free services of explosives companies' employees will be called upon to sign one or the other. Copies may be obtained through THE MINING CONGRESS JOURNAL, or from the Institute of Makers of Explosives, 350 Park Avenue, New York City.

A New Service to Our Readers

A wealth of important literature and data in the form of bulletins, reports, etc., issued by both the Government and private organizations, is constantly being received by THE MINING CONGRESS JOURNAL for publication or review. Space limitations prevent their being printed here other than in abstract form and in most cases with only a brief mention. Our readers will find much of this material of vast interest and value.

With this in mind, we invite you to make use of the JOURNAL'S "Information Service." Copies of any of the material mentioned, most of

which is distributed free of charge, will be furnished upon request. Where the Government or publishers make a charge in connection therewith, the price will be given in the notice.

As another feature of this service, we will gladly give personal attention to inquiries or requests for information that do not entail too great a degree of research and fulfill them to the best of our ability. Address your communications to

NEWS EDITOR
THE MINING CONGRESS JOURNAL
Washington, D. C.

COAL MINERS-OPERATORS CONFERENCE Sought by Government—Appears Doubtful

Whether or not a joint conference of coal operators and miners, proposed by Secretary of Commerce Lamont and Secretary of Labor Doak, will pan out is still a matter of uncertainty, as the Federal officials await the complete returns from invitations sent out July 22 to 150 prominent operators. Up to July 31 84 replies had been received, and the majority of these were not favorable to calling a conference, 38 being rejections, 12 being listed as qualified rejections, 21 were acceptances, and 13 qualified acceptances. In any event, it is not likely that any definite action will be taken for several weeks in this latest attempt of the Government to stabilize wages and improve general conditions in the industry.

A conference was held in Washington July 9, at the call of Mr. Lamont, with some 15 operators from the larger bituminous fields expressing the view that a national coal conference would be of little value to the industry, the public, or labor interests.

John L. Lewis, president, and a dozen other officials of the United Mine Workers again urged a national conference a few days later when they gathered at the Department of Labor at the invitation of Secretary Doak. They outlined in detail the reasons for wanting a conference, declaring that conditions in the industry from a human standpoint were bad and rapidly growing worse.

In a statement issued after the conference with the operators on July 9, Secretary Lamont said:

"The bearing of freight rates on coal marketing; the variance between scales of wages current in various parts of the country; status as to working arrangements, unemployment, and many other conditions in different coal mining districts were among the topics discussed. Many of the operators attending held the view that little could be accomplished of advantage to the public, the industry, or the workers engaged in it by the summoning of a national coal conference at this time. No final de-

cisions were arrived at in regard to this matter."

The operators present were: F. R. Lyon and W. W. Stevenson, of the Consolidation Coal Co.; C. E. Bockus, president, Clinchfield Coal Corp.; G. B. Harrington, president, Chicago, Wilmington and Franklin Coal Co.; T. B. Davis and J. D. Francis, president and vice president, Island Creek Coal Co.; R. H. Knodel, of the Stonega Coal Co.; Eugene McAuliffe, president, Union Pacific Coal Co.; J. D. A. Morrow, president, Pittsburgh Coal Co.; C. F. Richardson, president, West Kentucky Coal Co.; W. L. Robison, vice president, Youghiogheny and Ohio Coal Co.; Howard Showalter, president, Continental Coal Co.; P. M. Snyder, president, C. C. B. Smokeless Coal Co.; and F. E. Taplin, president, North American Coal Corporation.

Holly Stover, of Stover's Smokeless Coal Bureau; C. P. White, head, Coal Division, Bureau of Mines, and Clinton Coffin, assistant to the Secretary of Commerce, also attended.

Those attending the conference of the miners' representatives were: John L. Lewis, president, and Phillip Murray, vice president of the United Mine Workers; Thomas Kennedy, secretary-treasurer; Van A. Bitner, special representative of the mine workers for northern West Virginia; James Marks, and P. T. Fagan, presidents of two Pennsylvania districts; William Houston, international representative for southern West Virginia; William Turnblazer, president of District 19, east Kentucky and Tennessee; Ed Morgan, special representative for west Kentucky; Lee Hall, president of District 6, Ohio; Percy Tetlow, of the same district; David McDonald, assistant to the vice president of the United Mine Workers, and K. C. Adams.

Asked whether the National Miners' Union would be invited to a conference, Secretary Doak said that organization had eliminated itself when it notified President Hoover that it was against such an assembly.

Action against the Temple Company was instituted by the Federal Trade Commission in October, 1928, after it had acquired stock control of the Temple Coal Company, which owned anthracite properties in northern Pennsylvania, worth nearly \$14,000,000, in 1924, and about the same time acquiring about 98 percent of the stock of East Bear Ridge Colliery Co., whose mines in Schuylkill County were estimated to be worth about \$900,000.

Since the coal produced by the East Bear Ridge Company, and that of the Temple mines, which included several companies, was sold to the market through brokers, the commission held that the absorption by the Temple Company of the properties in both sections of the hard coal fields, was intended to create a monopoly and lessen competition.

The circuit court holds that the respective selling agents for the northern and southern mines are still in competition, and that the evidence fails to show any violation of the anti-trust laws. Even if there were a lessening of competition it is inconsequential, the opinion says.

Western Coal Operators Discuss Taxation

A. W. Dickinson, chief of the tax division of the American Mining Congress, on July 10 attended a special meeting called by the Utah Coal Producers Association at Salt Lake City and discussed tax and other matters of importance to the operators of that state, with particular reference to the program of the American Mining Congress for coal depletion. A similar meeting was held in Denver, July 21, with the Colorado and New Mexico Coal Operators Association.

Those attending the Salt Lake meeting were:

B. F. Dwinny, treasurer, Liberty Fuel Co.; Mr. James, chief clerk, Liberty Fuel Co.; J. J. Welsh, auditor, Standard Coal Co.; Sam Woodhead, secretary-treasurer, Independent Coal & Coke Co.; Thos. R. Stockett, general manager, Spring Canyon Coal Co.; Mr. Shurtliff, auditor, Royal Coal Co. and Spring Canyon Coal Co.; Mr. Penfold, assistant auditor, Utah Fuel Co.; J. Edw. Taylor, general manager, Mutual Coal Co.; Mr. Cropper, secretary-treasurer, Chesterfield Coal Co.; Glen Logan, auditor, Blue Blaze Coal Co.; E. R. Gibson, assistant controller, United States Fuel Co.; Mr. Craddock, tax department, United States Fuel Co.; Seymour B. Wells, of Schoefield-Wells Co., accountants and tax experts; J. R. Doolin, executive secretary, Utah Coal Producers Association, and A. G. Mackenzie, secretary, Utah Chapter, American Mining Congress.

Trade Commission Reversal in Temple Anthracite Coal Case

A Federal Trade Commission mandate requiring the Temple Anthracite Coal Company to rid itself of either extensive hard-coal interests in Lackawanna and Luzerne Counties, Pa., or smaller holdings in Schuylkill County, on the ground that the combination was a viola-

tion of the Clayton anti-trust law, was set aside by the United States Circuit Court of Appeals at Philadelphia, June 9.

Two of the judges concurred in the decision, while the third disagreed that the acquisition by the Temple Company of holdings in both the northern and southern anthracite regions of Pennsylvania did not constitute an illegal monopoly.

Kentucky Safety Meet August 15

The Kentucky Department of Mines announces that due to the economic situation of the coal industry they have called off all district first-aid contests this year and will hold only one meet. This will be the "State Meet" in which all districts will participate and will be held August 15, at Jenkins, Ky., a central location for the Hazard, Harlan, and Big Sandy districts from where most of the teams will come.

"Even though sales are considerably off, we must still go ahead with our safety program," says John F. Daniel, chief of the Kentucky Department of Mines. "For the first six months of this year we had 45 fatalities in and about the Kentucky mines as compared to 103 fatalities for the same period last year."

Coal-Mine Fatalities in June Show Decrease

Fatal accidents chargeable to the coal-mining industry in the United States in the month of June, 1931, numbered 88, according to information received by the Bureau of Mines from state mine inspectors. This was a reduction of 24 from the previous month and of 39 from the number reported for June, 1930. The fluctuation in the production of coal was not as pronounced as that of the accidents. In June of the present year 33,729,000 tons were mined, as compared with 33,319,000 tons in May, 1931, and 38,866,000 tons in June a year ago. The death rate per million tons of coal mined in June, 1931, was 2.61; for May, 1931, it was 3.36 and for June, 1930, it was 3.27.

Considering bituminous mines alone, the June fatality rate was lower than for June a year ago and also for the preceding month of May, the rate being 2.30 per million tons, as compared with 3.00 for last June and 2.61 for May, 1931. There were 67 men killed at bituminous mines in June of the present year, which was 34 less than in the same month last year and 7 less than in May. There were 29,185,000 tons of bituminous coal mined in June, 1931, as compared with 33,714,000 tons in June, 1930, and 28,314,000 tons in May, 1931.

In the anthracite mines of Pennsylvania there were 21 deaths during June of the present year, and a production of 4,544,000 tons of coal, thus indicating a fatality rate of 4.62, as compared with 38 deaths and a rate of 7.59 in May, 1931, when the production was 5,005,000 tons. In June a year ago 26 men lost their lives at anthracite mines during the mining of 5,152,000 tons of coal, resulting in a death rate of 5.05.

During the six-month period from

January to June, 1931, there were 730 deaths in all coal mines in the United States, and during the same period 221,339,000 tons of coal were produced. Reports for the same six months in 1930 showed 1,004 deaths and a production of 264,224,000 tons.

No major disaster occurred in June—that is, no disaster occurred in which five or more lives were lost. Three such disasters in January and one in May caused a total of 46 deaths. The period January to June of 1930, had a record of 7 major disasters which caused the loss of 88 lives.

Comparing the accident record for the first six months of 1931 with that for the same month of 1930, a reduction is noted in the death rates from falls of roof and coal, haulage, gas or dust explosions, explosives, and electricity, which are the principal causes of fatalities in coal mines.

Old Breaker Shuts Down

Lance No. 11 Colliery of Glen Alden Coal Company, at Plymouth, Pa., employing 1,100 men, was closed indefinitely early in July.

It was explained that the shutdown is necessary to make way for adjustments incident to the opening of a modern all-steel breaker, which will supplant the old breaker, and that changes in hoisting and shaft equipment will have to be made before the new breaker can be placed in operation.

Alpha Portland Cement Company sold its Phoenix coal mining property near Wolf Summit, W. Va., to Empire Fuel Company of Fairmont. The purchase includes unmined coal under 521 acres, 13 acres surface land and leasehold on 107 acres surface land, as well as mining machinery and equipment.

COAL MINE ACCIDENTS BY STATES IN 1930

Texas, Michigan, North Dakota, Montana, and Indiana led all other important coal-mining states in 1930 in having the lowest death rates from accidents among men employed in the mines, according to returns received from mining companies by the United States Bureau of Mines. Alabama, Missouri, Tennessee, Arkansas, and Kentucky had the lowest accident rates for non-fatal injuries.

These facts are shown by reports for 1930 which the Bureau of Mines had received from operating companies up to June 12 of the present year and represent companies that produced about

three-fourths of the total output of coal in the United States in 1930.

For each million man-hours of work performed, 2.07 deaths and 111 non-fatal injuries were reported. For every fatality reported there were 54 non-fatal injuries that disabled the employees for more than the remainder of the day on which the accident occurred. The relative standing of the coal-producing states, from the viewpoint of mine safety, as far as can be shown from accident reports thus far received by the Bureau, is indicated in the accompanying table.

RANK OF COAL-MINING STATES IN 1930 BASED UPON ACCIDENT-FREQUENCY RATES*

State	No. of fatalities per million man-hours	State	No. of non-fatal lost-time injuries per million man-hours
Texas .....	.....	Alabama	61.767
Michigan .....	.....	Missouri	63.840
North Dakota	0.706	Tennessee	69.335
Montana .....	.980	Arkansas	76.771
Indiana	1.105	Kentucky	81.703
Pennsylvania (bit.)	1.288	New Mexico	84.236
Maryland	1.468	Montana	85.764
†Alabama	1.669	Virginia	93.702
Illinois	1.737	West Virginia	94.507
Missouri	1.739	Texas	94.767
Tennessee	1.753	Pennsylvania (bit.)	100.651
†Pennsylvania (anth.)	1.838	Maryland	102.036
Iowa	1.939	North Dakota	104.553
†Kentucky	2.047	Colorado	108.159
United States	2.070	Ohio	110.818
Colorado	2.198	United States	111.058
Virginia	2.310	Michigan	119.656
Kansas	2.310	Kansas	126.493
†West Virginia	2.400	Wyoming	132.825
Wyoming	2.483	Pennsylvania (anth.)	137.292
Arkansas	2.545	Washington	139.498
†New Mexico	3.683	Indiana	142.720
†Ohio	4.522	Oklahoma	152.526
†Washington	5.486	Utah	158.675
†Utah	10.413	Iowa	161.188
†Oklahoma	17.319	Illinois	162.210

* These figures are based upon operators' reports for 1930 to the Bureau of Mines up to June 12, 1931 and represent companies that mined about three-fourths of the total output of coal in the United States in 1930.

† Includes one or more disasters that caused at least 5 deaths each.

General B. P. Disque Heads Anthracite Institute

The Anthracite Institute announces the election of General Brice P. Disque as its executive director.

General Disque brings to the anthracite industry a business perspective broadened by his wide diversification of experience in many lines of commercial and industrial activities. Following his resignation from the United States Army in 1919, he became president of G.



Amsinck & Co., Inc., of New York City, one of the country's largest foreign trading houses.

General Disque is best known for his remarkable success in organizing and directing the interests of the lumber industry of the Pacific Northwest. More recently he has been engaged in the financial and investment business in New York City.

His military career embraces 20 years of service in the United States Cavalry, during which he took part in the Philippine insurrection and the World War. He holds the Distinguished Service Medal of our own Government as well as decorations from several foreign countries.

The membership of the Anthracite Institute includes all the major producers of Pennsylvania anthracite, providing consumers with more than 50,000,000 tons of anthracite annually.

The executive committee of the Institute consists of the following: A. J. Maloney, president of the Philadelphia & Reading Coal & Iron Co., chairman; S. D. Warriner, president of the Lehigh Navigation Coal Co., president; Eliot Farley, president of the Delaware, Lackawanna & Western Coal Co.; R. F. Grant, president of the Lehigh Valley Coal Co.; F. W. Leamy, vice president of the Hudson Coal Co.; Michael Gallagher, president of the Pittston Co.; Donald Markle, president of the Hazle Brook Coal Co.; and Percy C. Madeira, Jr., president of the Madeira, Hill & Co.

SAGE FOUNDATION DRAFTS CODE

For Settlement of Coal Industry Ills

The Russell Sage Foundation issued a statement of principles for the peaceful settlement of wage disputes and for mine management in coal regions.

The code is part of a survey of the mine-labor problems which the Foundation will publish in the fall. It was drawn up in the "hope that it will help clarify understanding of the causes of coal strikes and thereby hasten settlement of the present strikes and reduce their frequency in this basic industry."

Overproduction and wasteful use of coal, which lead to conflict over wages between operator and miner, are given as the chief causes of disturbances.

In part, the code provides that mine employees laid off because of reductions in the working force must be reinstated when the management increases its force, and that miners are entitled to extra compensation for any extra duties they may be asked to perform.

Other provisions recommended in the code are:

An operator may hire whomever he pleases, provided he does not discriminate against miners for being active in union affairs.

Mine employees laid off because of a reduction in working force must be reinstated in their former positions when the force is increased. The same applies to miners injured while at their work.

Miners may be discharged for refusal to obey orders, loading impurities with coal, fighting, using abusive language, being absent for two days without just cause, or for failing to work eight hours if there is work to be done.

The pit committee must confine its activities to settling disputes referred to it by miners or operators.

Mine managers and assistants must not perform labor for which a scale of wages is specified in the union contract.

Operators are free to introduce any labor-saving devices.

Competent miners, if changed to other jobs, must be given an equivalent wage.

When a vacancy occurs, the operator must promote a competent miner who has the longest service record if such a procedure has been a custom of the mine.

The operator must pay miners for lost time if the company is responsible for the loss of time and consequent lessening of earning power.

Trade Commission Approves Southwestern Coal Operators' Trade Practice Rules

Trade practice rules of the bituminous coal operators of Missouri and Kansas have been approved by the Federal Trade Commission following a number of changes in wording suggested by the Commission and accepted by the industry.

The rules are divided into two groups, with the following subjects in Group I:

False advertising of grade or quality of product; defamation of competitors; imitation of trade marks, trade names or slogans; inducing breach of contract; secret giving of rewards with the effect of influencing discriminatory or unequal service; giving money to representatives of competitors' customers as an inducement to influence such customers' purchases; obtaining information from competitors concerning their businesses by false statements or by false impersonation of one in authority; selling goods below cost with the intent of injuring a competitor; discrimination in price; secret payments of rebates; and shipment of goods on consignment with the intent of injuring a competitor.

Group II rules accepted as expressions

of the trade relate to contracts as business obligations; false invoicing; publication of price lists; arbitration; and a committee on trade practices.

(THE MINING CONGRESS JOURNAL will furnish copies upon request.)

Receiver Appointed for Butler Consolidated

The Butler Consolidated Coal Company, Butler, Pa., went into the hands of receivers on July 21.

Marten A. Reiber, an attorney, was appointed receiver by Judge James O. Campbell, of Butler County, with authority to continue operation of the various mines of the company in Butler, Allegheny and Indiana Counties.

The company's Wildwood mine is said to be one of the best equipped in the country for the preparation of coal for the market.

The petition for a receivership was filed by the Union Trust Company, formerly the Guaranty Trust Company, of Butler, which is acting as trustee for the bondholders. It is said that the company has been in default in the last two interest periods.

Charles F. Hosford, Jr., president of the Butler Company, told the court that

plans were under way for a reorganization. Judge Campbell set August 4 for further hearing in the case.

Circuit Court Affirms "Pocahontas" Injunction

The United States Circuit Court of Appeals for the Seventh Circuit, at Chicago, Ill., has affirmed the action of the United States District Court at Indianapolis, in granting an injunction to restrain certain Indianapolis jobbers and retail coal dealers from substituting other coals for Pocahontas coal and from using the name "Pocahontas" in connection with any coal other than that produced in the Pocahontas coal field. This case was instituted nearly two years ago by the Pocahontas Operators Association.

Anthracite Industry Regaining Markets

The anthracite service in the first quarter of the fiscal coal year (April 1, 1931, to June 30, 1931) won from competitive fuel industries for the anthracite industry, markets with a consuming capacity of 107,417 tons of anthracite annually, according to the report of the anthracite service for that period.

The anthracite service is an organization, maintained by the producing companies in the anthracite industry, to render a combustion engineering service to anthracite consumers in this country and Canada.

The report shows that of the total tonnage won by the service in that period, 61,032 tons were in the industrial and commercial markets, 14,137 in the residential market and 32,248 tons in the market created by erection of new buildings. The fuels in competition with anthracite included Russian and Welsh anthracite, gas, oil, coke, and bituminous.

The district covered by the service includes all of the anthracite consuming area of this country and Canada.

A feature of that report was the very effective work of the anthracite service in combating fuel oil. Of the total of 107,417 tons won for the anthracite industry, the market for 47,507 tons of anthracite was taken from the fuel oil industry, and more than half of this was in the field of commercial and industrial buildings and institutions.

The total number of consumers serviced by the combustion engineering organization of the anthracite service in the three months' period was 2,850 representing a market for 298,363 tons of anthracite.

Holds President Can Not Place Oil Embargo

Attorney General Mitchell on July 23 ruled that under existing laws President Hoover has no authority to place an embargo on oil merely because of domestic overproduction.

The ruling was a result of President Hoover referring to the Attorney General several hundred telegrams and letters from the West and the Southwest asking the Chief Executive to invoke such an embargo.

Mitchell said in a lengthy ruling the question for decision was whether unfair methods of competition and unfair acts in the importation of articles in the United States had been disclosed.

"In other words," he said, "the question is whether the mere importation of oil into the United States in the ordinary course of business is an unfair method of competition or an unfair act within the meaning of the tariff law merely because the importation may have the effect of depressing an already glutted market.

The phrase "unfair methods of competition," which is used in the tariff act, the Attorney General said, has a well-defined legal meaning, and there is no suggestion that the importation of articles into the United States constitutes competition or unfair trade merely because there is already an oversupply within the United States.

CENSUS OF MINES AND QUARRIES COMPLETED

The Bureau of the Census has published a summary of statistics, by industries, of producing mines and quarries covering the operations in 1929 of 39 mining and quarrying industries, as classified for census purposes.

The present report, which gives summary figures for individual industries, completes the series of preliminary industry reports of the recent Census of Mines and Quarries, which was taken as a part of the Fifteenth Decennial Census.

According to this summarization, the combined value of products for the United States amounted to \$2,392,650,689, of

which coal contributed \$1,351,548,071, or 56.5 percent; metals, \$626,990,641, 26.2 percent; stone, \$195,804,724, 8.2 percent; and the miscellaneous industries, \$218,307,253, 9.1 percent. The total number of wage earners (average for the year) employed in the mining and quarrying industries was 806,043, distributed as follows: Coal, 601,235, or 74.6 percent; metals, 108,779, 13.5 percent; stone, 56,755, 7 percent; and the miscellaneous industries, 39,274, 4.9 percent.

Table I, below, presents a general summary of the mining industry for 1929 as compared with 1919. In Table II, on the following page, more detailed information is given for 1929.

TABLE I—SUMMARY FOR MINING AND QUARRYING INDUSTRIES—PRODUCING ENTERPRISES: 1929 AND 1919

[The statistics for 1929 and 1919 as shown in the table are not strictly comparable for the reason that data for the sand and gravel, glass-sand, and molding sand industries are included for the first time in the statistics for 1929. The 1919 figures have been revised by the omission of data for the Petroleum and Natural Gas industries, no data having been collected for these at the census for 1929.]

	1929	1919	Percent of increase or decrease (—)
Number of enterprises.....	10,135	11,466	—11.6
Number of mines and quarries.....	11,602	13,844	—16.2
Salaried officers and employees.....	48,135	¹ 56,515	—15.0
Wage earners (average for the year) ²	806,043	888,355	—9.3
Salaries.....	\$121,597,704	¹ \$115,860,617	5.0
Wages.....	\$1,083,640,059	\$1,161,414,979	—6.7
Contract work.....	\$25,406,253	\$10,716,518	137.1
Cost of supplies, materials, fuel, and purchased electric energy ³	\$413,246,896	² \$432,988,518	—4.5
Value of products.....	\$2,392,650,689	\$2,226,670,543	7.5
Rated horsepower capacity of power equipment, total.....	7,513,490	4,900,102	53.3
Prime movers.....	2,803,919	3,341,350	—16.1
Motors driven by purchased electric energy.....	4,709,571	1,558,752	202.1

¹ Includes data for salaried employees of central administrative offices.

² The average number of wage earners is based on the numbers reported for the several months of the year. This average somewhat exceeds the number that would have been required for the work performed if all had been continuously employed throughout the year, because of the fact that mining enterprises report the numbers employed on or about the 15th day of each month, as shown by the pay rolls, usually taking no account of the possibility that some or all of the wage earners may have been on part time or for some other reason may not actually have worked the entire month. Thus in some cases the number reported for a given month exceeds the average for that month.

³ The figure for 1919 includes \$7,091,681 representing the "cost of ore, coal, and other materials purchased as materials or for resale." Similar costs for such items are practically eliminated from the figure for 1929.

I. C. C. Advances Hearing Dates on Rate Increase

The Interstate Commerce Commission has advanced the date for continuing hearings on the 15 percent rate increase proposal. The advancement of the date for continuing hearings, which originally was set for August 31, was made on a motion by carriers for earlier completion than would have been possible under the original plans. It was opposed by shippers, who asserted they felt they were entitled to the full time originally announced to prepare their case.

A hearing August 10 will be held in Washington.

After the regional hearings in different sections of the country, the entire division of the commission that has been assigned to the rate case will assemble in Chicago on August 31 for the final hearings.

The assignments for the other hearings follow: Portland, Me., August 4, Commissioner Claude R. Porter and Examiner Irving L. Kich; Washington, August 10, Commissioner B. H. Meyer and Examiner M. A. Disque; Atlanta, August 17; Dallas, August 21, and Kansas

City, August 26, Commissioner Joseph B. Eastman and Examiners Howard Hosmer and H. W. Archer; Portland, Oreg., August 12; San Francisco, August 17, and Salt Lake City, August 24, Commissioners E. I. Lewis and William E. Lee and Examiners G. H. Mattingly and Myron Witters.

The commission informed persons expecting to introduce evidence at Portland, San Francisco and Salt Lake City, that, because of the limited time, their evidence should be condensed as much as possible, with one witness representing kindred interests and cumulative evidence and duplication cut to a minimum.

TABLE II—SUMMARY FOR MINING AND QUARRYING INDUSTRIES—PRODUCING ENTERPRISES, BY INDUSTRIES: 1929

Industries	Number of enterprises	Number of mines and quarries	Salaries officers and employees	Wage earners (average for the year)	Salaries	Wages	Contract work	Cost of supplies, materials, fuel and purchased electric energy	Value of products	Horsepower
All industries.....	10,135	11,602	48,035	806,043	\$121,597,704	\$1,083,640,059	\$25,406,253	\$413,246,896	\$2,392,650,689	7,513,490
Coal:										
Anthracite	198	303	7,655	142,801	19,335,930	229,967,059	6,801,803	57,295,739	334,854,300	1,041,465
Bituminous	4,976	5,620	20,826	458,484	48,840,030	574,800,072	1,889,627	144,707,082	966,693,771	3,124,767
Metals:										
Copper	143	180	3,465	44,493	10,136,354	64,849,996	10,944,697	59,232,681	283,336,884	701,241
Iron ore	180	208	2,182	28,516	6,138,284	40,905,190	1,553,134	28,464,643	197,334,548	498,821
Lead	155	171	944	14,006	2,546,150	22,917,435	1,032,085	13,591,717	67,561,773	194,380
Zinc	148	204	874	11,860	2,567,264	16,274,339	621,478	11,190,388	44,866,026	163,382
Gold, lode	174	184	443	8,350	1,311,247	8,655,505	556,148	5,381,287	17,650,174	69,829
Silver	67	74	220	2,593	607,428	4,326,719	137,970	2,427,325	8,457,263	28,943
Gold, placer	32	37	90	678	259,841	970,010	1,708	1,195,532	3,779,241	20,280
Mercury	40	40	88	1,029	219,708	1,883,603	15,292	762,742	2,820,166	5,625
Manganese	19	21	35	354	88,095	392,362	5,824	210,463	1,184,561	2,342
Stone:										
Limestone, including dolomite, cement rock, and calcareous marls	1,167	1,256	2,785	32,272	7,188,513	39,188,364	418,760	29,137,493	117,257,784	534,762
Granite	406	434	879	10,037	2,588,145	12,639,524	39,273	5,380,504	30,381,373	108,217
Basalt	137	144	353	3,053	909,123	4,498,093	31,951	3,241,483	15,543,687	63,131
Slate	120	130	266	4,103	710,604	4,884,033	26,574	1,296,655	10,486,390	33,577
Marble, including serpentine (verde antique)	70	89	237	3,350	580,243	3,291,541	18,225	1,098,251	7,538,905	30,198
Sandstone ¹	144	171	224	2,099	521,917	2,569,512	47,565	1,326,059	6,121,577	23,045
Miscellaneous, not included in other stones	204	234	242	1,841	365,687	2,405,908	52,056	2,074,757	8,475,008	23,509
Miscellaneous:										
Abrasive materials ²	30	36	63	462	167,368	491,484	37,353	208,694	1,411,284	3,823
Asbestos	11	11	16	195	34,280	236,789	2,000	75,517	397,482	2,114
Asphalt and bituminous rock	21	25	183	1,123	585,563	1,254,335	84,278	694,995	5,123,836	13,309
Barite	42	44	45	844	101,715	648,488	24,434	288,084	1,801,314	6,066
Clay	198	235	348	4,120	788,675	3,733,598	20,058	2,258,343	10,685,202	31,849
Feldspar	51	58	87	598	183,921	526,896	14,240	322,604	1,935,335	6,698
Fluorspar	28	36	118	1,053	289,917	1,112,322	16,540	803,554	2,858,344	6,513
Fuller's and filtering earths	23	25	106	1,010	306,217	877,628	350,979	876,423	4,879,872	8,249
Gypsum	60	63	134	2,078	306,659	2,627,733	7,004	1,216,214	5,740,188	26,498
Magnesite	5	5	27	351	83,201	465,936	85,970	540,545	2,043,905	3,197
Mica	24	32	23	226	58,193	195,142	.....	100,890	516,305	1,721
Millstones and pulpstones	14	14	27	164	97,266	221,318	.....	66,233	620,835	2,517
Minor metals ³	26	30	171	1,244	597,415	1,506,851	86,490	1,824,415	6,649,976	13,469
Phosphate rock	26	33	287	3,201	708,019	3,303,940	20,936	3,526,309	13,048,769	104,146
Sand, glass ⁴	25	32	95	1,030	277,679	1,313,503	15,000	1,362,331	5,359,216	13,214
Sand, molding	90	128	200	1,037	606,419	1,290,854	121,448	660,737	4,775,957	14,792
Sand and gravel.....	957	1,165	3,672	15,994	10,746,244	22,779,984	324,718	20,827,573	102,311,914	516,745
Silica ⁵	71	74	218	1,490	525,747	1,734,332	3,566	949,917	4,835,542	12,661
Sulphur and pyrites....	9	10	305	2,199	954,998	3,482,606	10,269	7,813,372	37,126,143	33,932
Talc and soapstone....	25	28	82	650	216,917	615,355	16,795	658,995	2,687,953	33,932
Miscellaneous minerals ⁶	19	19	38	305	81,439	301,197	.....	255,347	3,502,876	3,978

¹ See Table I, footnote 2.

² Excluding sandstone which is used in the manufacture of glass, refractory and abrasive products, etc.

³ Includes enterprises as follows: Emery, 2; garnet and industrial sapphire, 7; grinding pebbles and tube-mill lining, 2; grindstones, oilstones, whetstones, scythes, and rubbing stones, 12; pumice, 7.

⁴ Includes enterprises as follows: Bauxite, 9; molybdenum, 2; titanium, 1; tungsten, 13; vanadium, 1.

⁵ Including sandstone which is ground for use in the manufacture of glass.

⁶ Includes enterprises as follows: Diatomaceous earth, 10; ganister, 18; mica schist (highly siliceous), 3; quartz, 9; quartzite, 3; silica rock, 6; silica sand, 14; tripoli, 8.

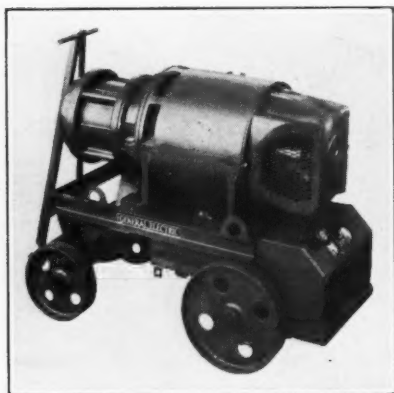
⁷ Includes enterprises as follows: Borate, 2; columbite 1; cyanite 2; graphite 5; lithium minerals (amblygonite, lepidolite, and spodumene), 4; mineral pigments, 4; vermiculite, 1.

WITH THE MANUFACTURERS

New Welding Sets Have Many Improvements

The General Electric Company announces a new line of single-operator welding sets in which are incorporated many improvements over past designs. This has been designated the WD-20 line as the types are numbered WD-21, 22, 23, 24, and 26, covering the 100-, 200-, 300-, 400-, and 600-ampere ratings respectively.

It includes both portable and stationary sets, the basic form being stationary



with but a slight change needed to make it portable. Types include those for operation on either alternating or direct current at all standard voltages and, in the case of alternating current, standard frequencies and 2 and 3 phase gasoline-engine-driven sets will also be available.

Among the principal advantages of the line are the use of two-bearing construction on the a-c. types up to 600 amperes; compactness and light weight; and greatly improved welding characteristics. The sets are self-excited with a tapped series field for major current adjustments and a shunt field rheostat giving duplex voltage control.

The latest design of standard a-c. motor has been specially adapted for use in the a-c. sets. Generators are of a distinctive new design while retaining all the good features of the past equipment. The direct-current motors are of the latest standard d-c. design.

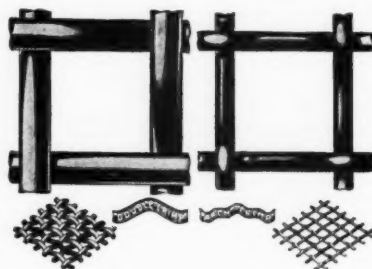
A typical a-c. set consists of a generator with an over-hung driving motor

mounted on a simple base to which is attached a strong sheet-metal control cabinet enclosing the generator control devices, meters and motor starting equipment. A specially designed transformer-reactor is mounted in the base under the generator. Base supports are arranged to be bolted to the floor or to have axles and wheels readily attached. The whole assembly occupies a minimum of space, a typical 300-ampere, a-c. set standing 36 in. high and 50 in. long by 23 in. wide. The weight of such a set is 1,865 pounds.

"Spring-Steel" Woven-Wire Screens

After five years of experimentation and development The Ludlow-Saylor Wire Company of St. Louis have rounded out a full line of alloy-steel woven wire screens in the coarse meshes, suitable for service both as revolving-screen jackets and as vibrating-screen sections, and for various other applications where screens are required for rough, abrasive work.

These newly-developed alloy-steel screens are now being offered for ore-dressing and coal-preparation under the name of "Spring-Steel" woven wire screens, in an 8-page bulletin just re-



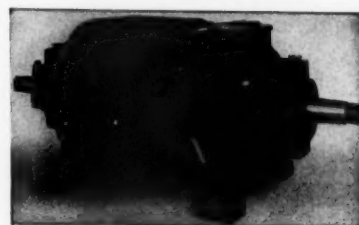
leased by the manufacturers. This bulletin lists approximately 250 widely-used grades and meshes, ranging from 4-in. openings made of heavy "Spring-Steel" bars, down to 1 1/16-in. openings of No. 20 "Spring-Steel" wire.

Samples are offered by the company to users of crushing and screening equipments.

New Steel Mill Motor Developed by Westinghouse

A new steel mill motor, designed for heavy duty applications, such as steel mill auxiliary drives, cranes, hoists, shovels, coal and ore bridges, mine hoists, railway turntables, conveyors, etc., has been developed through the cooperative efforts of steel mill engineers and the Westinghouse Electric and Manufacturing Company. The design of this motor embodies the latest suggestions and recommendations of the Association of Iron and Steel Electrical Engineers.

It has many new and distinctive fea-



tures. The field coils and poles are positively secured to frame without the necessity of washers or springs or other parts liable to become loose and cause damage. The improved bearing housings are securely held from turning by a clamp on each side of the housings and accommodate, interchangeably, ball or roller bearings of any standard make for grease or oil lubrication.

Deep commutator bars and wide risers permit many replacements giving added years of commutator life. Laminated commutating poles prevent injurious sparking and give excellent performance, particularly in plugging and reversing. This construction permits high overload capacity without injury to commutator or brushes.

These motors have massive cast steel frames which are split horizontally, so the top half can readily be swung back without disconnecting any leads. The halves are hinged on all frames, which makes convenient the removal of the armature bearings.

The Pennsylvania Drilling Company recently moved to their new plant at 1201-1215 Chartiers Avenue, Pittsburgh (Elliott), Pa. They were formerly located on West Carson Street.

New Edison "C" Type Battery

To meet the increasing demand for large capacity cells, the Edison Storage Battery Company, Orange, N. J., has added to its list of cells in regular production a new series known as the "C" type. They are manufactured in five different ampere hour capacities ranging from 337.5 ampere hours to 675 ampere hours.

These cells vary in their manufacture from the "A" type cells only in the fact that each positive and negative plate is approximately 50 percent higher than the "A" type positive and negative plate.

Not only is the ampere hour capacity of a "C" type cell 50 percent greater than the corresponding "A" type cell containing the same number of positive plates, but its rated watt hour capacity is also 50 percent greater. Thus without impairing the flexibility of a vehicle for use in narrow aisles, small elevators, restricted mine entries and shafts, it is possible to give a 50 percent increase in working capacity on one charge of the battery, with no increase in square area of battery compartment floor space required.

New Link-Belt Book on Apron Feeders

A new book, No. 1351, has been published by Link-Belt Company, Chicago, on Heavy-Duty Apron Feeders, superseding previous literature on the subject.

A feature of the publication is the completeness of the tables and drawings, enabling the engineer to make complete preliminary layouts without consultation with the manufacturer. This includes selection of the proper width of the apron, pitch of chain, sprocket sizes, size of head shaft required, etc.

The feeder, which is made of manganese steel, is suitable for handling either abrasive or non-abrasive material containing lumps of $\frac{1}{4}$ -inch size, and smaller, up to 6-foot dimensions—being especially adapted to the handling of extremely heavy, large, lumpy and abrasive materials. A copy of the new book will be sent to anyone requesting it.

Aluminum Fence Booklet

A booklet entitled "Why Aluminum Fence," outlining the development of aluminum and why it makes a better fence, has recently been issued, and a copy can be secured from the Page Steel & Wire Company, Bridgeport, Conn.

Aluminum for the manufacture of woven wire fences is meeting with widespread approval due to the fact that it is non-corrodable and does not require periodic painting to keep it in perfect condition.

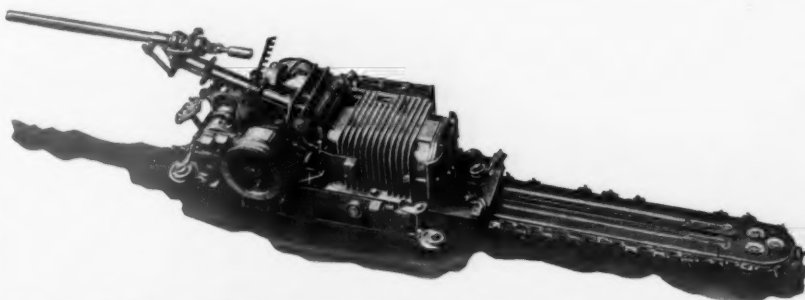
New Shortwall Power Drills

To meet the demand for a long lived, rugged and powerful drill with performance equal to the modern coal cutters, two new drilling attachments for shortwalls have been developed by the Goodman Manufacturing Company, Chicago.

One, the Type "E" drill, is designed to fit all types 212 shortwalls. It is driven by a spur gear meshing with the intermediate spur gear of the shortwall gear train.

One conveniently located hand lever positively controls the thread bar. When the control lever is in neutral position, all parts are at rest, except the gear encased and meshing with the shortwall gear. Its rate of speed may be varied from zero to maximum by adjusting a hand nut on the drilling head and, when desired, the thread bar may be freely slid through the drilling head by opening the slit boxing.

All running parts are correspondingly



Above, a top view of a type F drill mounted on a Goodman 112 Shortwall.



Left, the type F drill with guard tube removed and thread bar slid over top of the machine, thus making its use in thickly timbered places possible.

The second, Type "F" drill, is designed to fit all types 12 and 112 shortwalls, receiving its power directly from the armature pinion of the cutting machine motor.

The new drills are recommended for shot holes in coal even larger than required for Cardox, and they can be readily installed on all types of Goodman shortwalls. Both types of drills are powered by the shortwall motor, thus eliminating the commonly used small high-speed motor with attendant switch and trailing cables.

In both devices, the strongarm which supports the drilling head is inclined away from the face, permitting ample space to start a suitable length of auger. The drilling attachments are bolted on top of the shortwall and increase the overall height of the cutting machine from 9 to 12 in., depending on the units involved.

equal to those used on the shortwall machine and therefore many times the size of those used in the portable drills.

The strongarm is held at various angles to the shortwall by a rack. The drilling head may be angled to and turned around the strongarm by loosening and tightening one nut. The drilling head, together with the handling of the shortwall machine, provides adjustment for drilling any position required to properly shoot a face.

The drill heads and component parts for these units are interchangeable with those used on the Goodman hitch cutters, which are successfully drilling holes up to 10 in. in diameter.

In accordance with the regular annual practice, The Timken Roller Bearing Company plants were shut down from July 16 to July 29, for the regular summer vacation.

Combustion Steam Generator

Combustion Engineering Corporation, New York, has issued Catalog SG-1, describing the Combustion Steam Generator, which is a single unit embodying in an integral design the several elements required in steam production.

The generator is available in eight standard sizes, providing a wide range of capacities for any desired steam pressure and temperature. Pulverized fuel is introduced at the four corners of a completely water-cooled furnace and is burned with intense turbulent mixing action. The gases leaving the furnace pass through the superheater at the top of the furnace, thence through a bank of convection tubes and finally through a plate-type air preheater, to the chimney. A novel arrangement provides for regulating the temperature of the superheated steam under all conditions.

The catalog is well illustrated and includes overall dimensions of the eight sizes of steam generators.

Cast Iron Pipe Catalog

The American Cast Iron Pipe Company, of Birmingham, Ala., has issued a 48-page catalogue describing their "Doublex Simplex" cast iron pipe. The book contains much useful information and is profusely illustrated.

"Doublex Simplex pipe is the outgrowth of two major developments," state the manufacturers; "pipe made centrifugally in refractory molds, and the development of a satisfactory joint embodying the stuffing box gland principle. This pipe has the advantage of cast iron in material and in life, and has the ease of joining characteristic of the bolted flange."

Turbo Blowers and Compressors

Ingersoll-Rand Company has issued Bulletin No. 3132, a 44-page booklet which illustrates and describes its line of turbo-blowers and turbo-compressors. The bulletin covers the construction and operation of single-stage and multi-stage blowers for discharge pressures of 1 to 40 pounds and capacities of 3,000 to 100,000 cubic feet per minute; and turbo-compressors for discharge pressures up to 110 pounds and capacities of 8,000 to 10,000 cubic feet per minute. The booklet contains 37 illustrations, including sectional drawings, charts, blower parts, and complete units.

The Brown-Fayro Company, Johnstown, Pa., has opened a branch office at Charlestown, W. Va. O. B. Clark, formerly industrial sales representative for the Westinghouse Electric & Manufacturing Company in the Johnstown district, is in charge with headquarters at 311 Park Drive, Charleston.

Westinghouse Reorganizes Headquarters Sales Department

The Westinghouse Electric and Manufacturing Company has appointed T. J. Pace as assistant to vice president, in charge of general market planning and research analysis; M. B. Lambert, sales manager in charge of transportation department; O. F. Stroman, sales manager in charge of industrial department; and R. A. Neal, sales manager in charge



T. J. Pace

of central station department. Changed economic conditions required constructive re-alignment of all departments, according to J. S. Tritle, vice president and general manager of Westinghouse,



O. F. Stroman

so that the company could more effectively serve its thousands of customers and at the same time carry on more progressive development for the needs of all industries.

"Modern business conditions," continued Mr. Tritle, "require constant mar-

ket planning research and analysis of the highest order, thus making it possible for management to foresee business trends and quickly adjust itself to business requirements and give better response to all of its customers, and operate more efficiently."

Mr. Pace has been since 1926 director of sales. He joined Westinghouse Electric in 1902 when the Manhattan General Construction Company, of which he was assistant general manager, was absorbed by the Westinghouse Company. Mr. Pace has played a leading part in standardization of design and application in the electrical industry and he has had much to do with formulating broad commercial policies for the industry.

Mr. Neal, sales manager in charge of the central station department, has been with the Westinghouse Company since 1910. He was made manager of the switch section in 1920 and remained in that position until 1926 when he was appointed switchgear apparatus manager.

O. F. Stroman, sales manager in charge of industrial department, will have charge of the sale of Westinghouse products to all industries throughout the United States, except the transportation and central station industries. Mr. Stroman has been associated with the Westinghouse Company since 1903. In 1912 he was made assistant to the manager of industrial sales department, and held that position until 1926 when he was appointed motor apparatus manager. His experience in the application of electricity to industry, dates back 25 years, during which time he has witnessed and participated in the major electrification of industry. Mr. Stroman is an executive member for Westinghouse in the National Electric Manufacturers Association.

The main sales office of the Roessler & Hasslacher Chemical Company is now located in the Empire State Building, New York City. Former headquarters were at 10 East 40th Street.

Truman P. Gaylord, 60, vice president of the Westinghouse Electric and Manufacturing Company, died suddenly July 5, in Shelby, Mich., where he had been visiting his mother.

Mr. Gaylord was born in the town where he died. He entered the employ of the Westinghouse Electric and Manufacturing Company in 1898. He was appointed district manager of the Westinghouse Company's Chicago office in 1902, the position he occupied until he was made acting vice president in August, 1914. He was elected vice president in April, 1929.



Linde Oxygen

Plants and warehouses in all industrial centers make Linde Oxygen, in the familiar grey and green cylinders, available everywhere at minimum transportation cost. Users also benefit from the unique engineering facilities of Linde Process Service.



Prest-O-Lite Acetylene

Prest-O-Lite Dissolved Acetylene... the standard for well over a quarter of a century... is available from a Prest-O-Lite plant or warehouse near you. Prest-O-Lite is portable, convenient, economical.



Oxweld Apparatus and Supplies

Suitable Oxweld blowpipes, regulators, welding rods and supplies are available for every operation. Complete stocks and service stations are located in all principal cities. Oxweld low-pressure injector type blowpipes, High Test welding rods and other supplies represent maximum values in oxy-acetylene welding and cutting equipment.



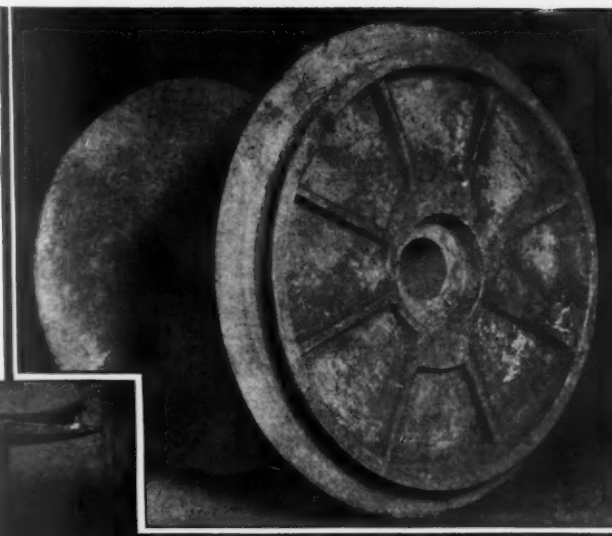
Union Carbide

Careful expansion of distributing facilities has made Union Carbide available to every American industry from over 250 warehouse stocks. Sold always in the Blue and Grey drum, it has been the accepted standard for uniform high quality for more than 30 years.



This cast steel hoist drum was broken in an accident and ordinarily would have gone to the scrap heap—

but



—in a few hours, by oxy-acetylene welding it was returned to service as good as ever.

Who ever heard of scrapping dividends?

THE scrap pile isn't entitled to dividends but it is getting a good share of your profits if you scrap worn or damaged equipment that oxwelding can reclaim.

The management of a blast furnace found that with the oxy-acetylene welding and cutting process parts formerly discarded could be repaired at a saving of \$5,925.00 a month in replacement costs. Thousands of other organizations use oxwelding for maintenance and repair just as effectively—and reduce scrap losses to a minimum.

Oxwelding equipment is inexpensive. Any good workman can be trained to operate it in a relatively short time. The savings that oxwelding can effect in your plant will pay real dividends to you.

THE LINDE AIR PRODUCTS COMPANY

Unit of Union Carbide and Carbon Corporation

126 Producing Plants **UCC** 627 Warehouse Stocks

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AMERICAN STEEL & WIRE COMPANY WIRE ROPE



SO important is wire rope to industry—on excavating machines—on hoists—on elevators—and for a thousand and one purposes—that its users can afford only to specify a brand of proved dependability, economy and long life. Because of its outstanding records—and the known reliability of its maker—American Steel & Wire Company American Wire Rope will be found on most equipment where service requirements are severe.

*Made by the Largest Wire
Rope Manufacturer in the World*

The illustration shows American Wire Rope in use on the world's largest electric shovel.

1831



1931

AMERICAN STEEL & WIRE COMPANY

SUBSIDIARY OF UNITED STATES STEEL CORPORATION

208 South La Salle Street, Chicago

And All Principal Cities

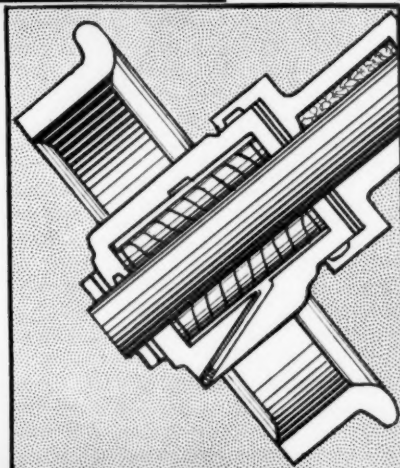
Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Export Distributors: United States Steel Products Company, New York

EGYPTIAN MINING EQUIPMENT

MINE CARS
FROGS: SHAKER
DRIVING EQUIP-
MENT: SWITCHES

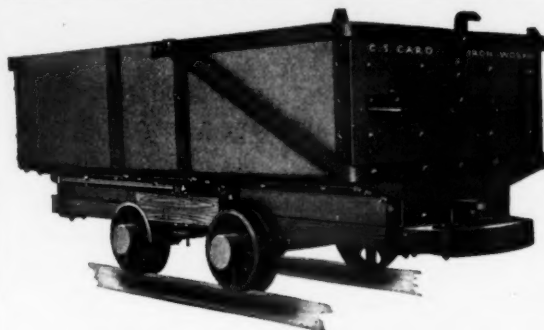
EGYPTIAN
WHEELS
WITH HYATT
FLEXIBLE
ROLLER BEARINGS
SAVE POWER,
SAVE LUBRI-
CATION, ARE
SMOOTH-ROLL-
ING AND LONG
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EGYPTIAN IRON WORKS MURPHYSBORO · ILLINOIS

SEND FOR
DESCRIPTIVE
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CARD CARS



MANY mines are enjoying "lowest cost per ton mile haul" because they called for a new deal and specified "Cards". We build coal and ore cars to specifications, and offer a good choice of standard models in our Catalog J.

C.S. Card Iron Works Co.
Denver, Colorado.

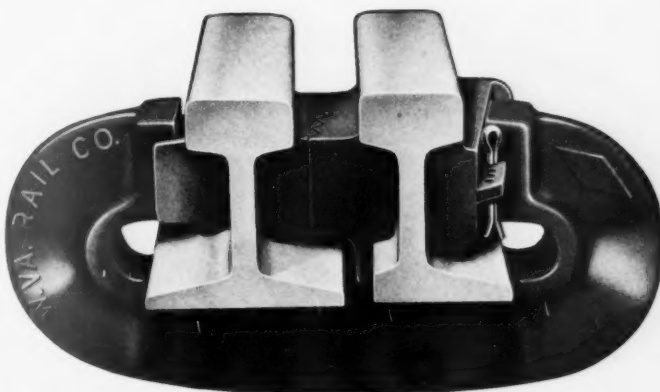
"WEST VIRGINIA" GUARD RAIL CLAMP

Easily installed, these clamps hold guard rails rigidly in place. Such clamps have been adopted as standard by most railroads and heavy users of track equipment. West Virginia clamps are made with special alloy steel yoke giving great strength without excessive weight. They are adjustable and will hold permanently after the wedge is driven up tight. This and other helpful modern track is described in our catalog which will be sent upon request.

THE
**WEST VIRGINIA
RAIL COMPANY**



HUNTINGTON
WEST VIRGINIA



*Rails and Accessories, Frogs, Switches,
Steel Ties and Special Track Work in
stock for prompt shipment.*

SKULLGARD

The New Model M-S-A Protective Cap



Protects the SKULL from Injuries

Equipping your men with SKULLGARDS will largely eliminate Head Injuries and reduce Compensation Costs. Due to the low price and long life, it costs no more to wear one of these comfortable SKULLGARDS than the ordinary type of cap or hat—and in addition have the Protection which SKULLGARDS afford. Complete details on request. Write for Bulletin No. 75.

Mine Safety Appliances Co.

Braddock, Thomas and Heade Sts., Pittsburgh, Pa.

"EVERYTHING FOR MINE and INDUSTRIAL SAFETY"

SAFETY *with* PROFIT

Robinson Engineers will be glad to check over your power consumption and the operation of your present mine fans. Enormous savings are being made every day by the use of Robinson engineering and Robinson fans. Operators have been astonished when shown their losses due to improper fan equipment.

**ROBINSON
VENTILATING CO.**

ZELIENOPLE - PENNSYLVANIA



CONNELLSVILLE renewable wearing-surface sheaves

CONNELLSVILLE
Sheaves have great strength and elasticity. They withstand heavy loads, shocks and stresses. Hub, spokes and main rim are cast in one piece. A hard, locomotive tire steel ring, made IN ONE PIECE fits over a turned position of the rim. A follower, bolted to the

main rim, holds this ring in place. This sheave, under unusually hard service, will give 8 to 10 years of service. Steel rope will not cut or rough them. Rope will last longer than on soft steel or cast iron groove.

Bearings are weather-proof, oil proof and collar

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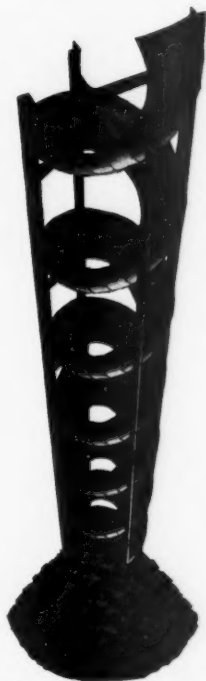
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INDEX TO ADVERTISERS

Allis-Chalmers Mfg. Co.....	15	Linde Air Products Co., The.....	19
American Steel & Wire Co.....	20	Mine Safety Appliances Co.....	21
Ayer & Lord Tie Co.....	23	Mott Core Drilling Co.....	22
Card Iron Works Co., C. S.....	20	Ohio Brass Co.....	14
Carnegie Steel Co.....	6	Patrick, R. S.....	23
Connellsville Mfg. & Mine Supply Co.....	22	Pennsylvania Drilling Co.....	22
Du Pont De Nemours & Co., Inc., E. I.....	10-11	Phelps Dodge Corp.....	23
Egyptian Iron Works.....	20	Radiore Co., The.....	22
Ensign-Bickford Co., The.....	Inside Front Cover	Roberts & Schaefer Co.....	3
Enterprise Wheel & Car Corp.....	23	Robinson Ventilating Co.....	21
Fairmont Mining Machy. Co.....	17	Roebbing's Sons Co., John A.....	5
General Electric Co.....	8	Scholz, Carl.....	22
Grasselli Chemical Co., The.....	13	Stonehouse Signs.....	22
Hoffman Bros. Drilling Co.....	22	Timken Roller Bearing Co.....	18
Holmes & Bros., Inc., Robt.....	23	Union Carbide Co.....	19
Jeffrey Mfg. Co., The.....	7	Universal Vibrating Screen Co.....	22
Joy Mfg. Co.....	Back Cover	West Virginia Rail Co.....	21

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